

10. The Real Nature and Causes of Illness

“The belief in diseases and cures stands as an effective barrier to a true education in healthful living.” Herbert Shelton

Modern medicine is based on the core assertion that impaired health can be remedied through the use of medicines that fight diseases and vaccines that prevent them. Furthermore, modern medicine is claimed to be the only healthcare system capable of defeating and preventing disease because it is the only one that is firmly grounded in evidence-based science.

However, as demonstrated by the discussions throughout this book, and especially in this final chapter, nothing could be further from the truth.

It is generally claimed that modern medicine emerged as the result of scientific advances made during the 17th and 18th centuries, although it was not until the late 19th century that some of the most significant medical ‘breakthroughs’ occurred. The most important of these include: the identification of different bacteria, the formulation of the ‘germ theory’ and the development and use of a number of vaccines.

The pace at which modern medicine progressed began to accelerate through the early decades of the 20th century, mainly as the result of technological innovations. The invention of the electron microscope in the 1930s, for example, enabled scientists to view smaller structures than had previously been possible, which led them to discover the particles that became known as ‘viruses’. The development of advanced technologies progressed at an increasingly faster pace during the latter part of the 20th century and has continued to do so into the early 21st century. These technologies have been utilised by modern medicine and have facilitated the development of increasingly sophisticated medical

devices and equipment for purposes such as diagnostics, treatments and laboratory-based research.

Yet modern medicine can only boast a single victory over diseases that affect humans, namely, the eradication of smallpox; but, as previously discussed, this is an invalid boast. It is clear therefore, that, despite the passage of more than two centuries and the expenditure of unimaginably huge sums of money, the successful defeat of 'human disease' remains elusive to the medical establishment.

Although claimed to be thoroughly scientific, modern medicine adopted an approach towards disease and its treatment that was based on two long-held beliefs that substantially predate the era of modern science. One of these beliefs claims that each disease is a distinct entity that attacks the human body; the other claims that each disease can be defeated through the use of the appropriate medicine. The acceptance of the 'germ theory' led to the adoption of a third belief, which claims that diseases caused by 'germs' can be prevented by vaccines. These beliefs are, however, fundamentally flawed; they do not accurately represent the nature of disease or the means by which diseases should be treated or can be prevented. The failure of modern medicine to defeat disease is entirely attributable to the rigid adherence to these flawed beliefs.

Unfortunately, virtually all forms of 'healthcare' operate from the basis of the same flawed theories about the nature of disease. The reason for the focus on 'modern medicine', or the medical establishment as it is referred to in this book, is because it is the healthcare system that is to be implemented by all WHO Member States in order to achieve the aims of the 2030 Agenda, which include the introduction of universal health coverage and increased access to 'medicines and vaccines for all'. It is therefore imperative to expose the erroneous nature of the theories that underpin the practices of this healthcare system; such exposure is a core purpose of this book.

It is important to reiterate that the failings of the medical establishment system, as described throughout this book, refer solely to the approach to 'disease', they do not apply to emergency

procedures or the use of surgical operations for physical injuries. Herbert Shelton explains this distinction in the statement that,

“Only those materials and influences which are useful in the preservation of health are useful in the restoration of health. To this principle Hygienists make but one exception: namely, constructive surgery, as employed in wounds, broken bones, accidents, dislocations, etc.”

All quotes by Herbert Shelton included in this chapter are from his book entitled *Natural Hygiene: Man's Pristine Way of Life*, unless otherwise stated.

It should be noted that the materials used by the medical establishment for the treatment and prevention of disease are not conducive to the preservation or restoration of health. All medicines and vaccines produced by the pharmaceutical industry are acknowledged to induce unintended effects in addition to their intended effects. But these additional effects are usually referred to as ‘side effects’ as if they are of little importance, but this is grossly misleading. Although unintended, these effects are, in reality, direct effects; their occurrence after the administration of a medicine or vaccine provides clear confirmation that these products are inimical to health, not supportive of it. Evidence of the harm they can cause is also confirmed by the phenomenon known as iatrogenesis, the incidence of which continues to rise.

It may be argued that the occurrence of adverse effects after the administration of a medicine or vaccine may indicate a correlation but should not be interpreted as evidence of causation. This argument is, however unjustified and unjustifiable; it can be refuted by the counter argument that all pharmaceutical medicines and vaccines are acknowledged to produce ‘side effects’; they are therefore the direct causes of these effects. Furthermore, the majority of the chemical ingredients of pharmaceuticals, both medicines and vaccines, are inherently toxic to the human body. Many medicines are intentionally toxic; for example, the purpose of antibiotics and antivirals is to kill ‘germs’ and the purpose of cancer treatments is to kill cancerous cells. However, although treatments of this nature are known to be harmful to the patient, they are believed

to be able to kill the causal agents of disease and therefore restore the patient to health.

The notion that poisons can preserve or restore health is entirely unfounded; it is impossible to poison a body back to health.

The inherently toxic nature of pharmaceuticals means that their effects are always harmful, as Herbert Shelton explains,

“The only legitimate study of drugs in their relation to the body is that of toxicology. The local, general, synergistic, antagonistic, therapeutic and physiological ‘actions’ of drugs are myths, equally with their ‘empiric actions’. That they accumulate in the body, that they occasion ‘side actions’, that they poison and injure, we do not deny. We only deny that they ever do anything else.”

It is clear therefore, that the idea that pharmaceuticals can have a ‘beneficial’ effect on health is grossly mistaken. The reason they may appear to be beneficial is due to a complete misunderstanding of the nature and functions of the human body. As discussed in more detail later in this chapter, the human body is not mechanistic in nature; it is not an inert, albeit living, machine. On the contrary, it is a complex, self-regulating organism that is the only ‘agent’ with the ability to defeat disease; it is only the body that is able to restore and maintain health, which is the body’s natural state.

A problem can only be solved when the nature of the problem has been fully understood and its root cause or causes have been correctly identified. Once this knowledge has been gained, it is possible to devise and implement the appropriate measures that have the ability to address the causes and thereby resolve the problem, which will eventually cease to exist.

It is clear that the problem of disease remains unresolved by the medical establishment; unfortunately, it is a problem that is not even in the process of being resolved. On the contrary, it is a continually worsening problem; the health of the vast majority of the people around the world is deteriorating not improving.

One of the main contributory factors to this problem is the fact that the medical establishment, which has assumed responsibility for the health of the entire world population, operates from the basis of fundamentally flawed beliefs about diseases and their causes as

well, as the methods by which they should be treated and prevented. The rigid adherence to these erroneous beliefs perpetuates the existence of a serious obstacle to the medical establishment's ability to gain a full understanding of the real nature of disease, and thereby solve the problem.

The failure of modern medicine to solve this problem does not mean that it cannot be solved; as the discussions in this chapter will demonstrate.

The Nature of 'Disease'

The establishment defines a 'disease' as,

“a disorder with a specific cause (which may or may not be known) and recognizable signs and symptoms...”

It is a core assertion of this book that the medical establishment has a poor level of understanding of the real nature of 'disease'. Whilst this assertion will no doubt be considered highly controversial; it is nevertheless corroborated by many of the medical establishment's own statements. The discussions in chapter seven, for example, reveal admissions that not only are the exact causes of a number of major NCDs unknown, but that many aspects of these diseases remain poorly understood. In addition, although infectious diseases are claimed to be understood, the discussions in chapter three reveal the existence of many anomalies and contradictions that seriously challenge this claim, and show that many aspects of these diseases also remain poorly understood.

In addition to the three beliefs discussed in the previous section, modern medicine has also adopted two philosophical doctrines; namely, mechanism, which posits the view that the human body is little more than a complex, albeit living, machine, and determinism, which posits the view that events are largely governed by pre-determining factors. In the context of disease, these doctrines mean that the human organism, which is considered to be essentially 'inert', can be attacked by any disease 'entity' as the result of certain pre-determining factors, especially genes, and that the battle against these disease entities, especially 'germs', can be successfully fought by the methods and practices of modern medicine. This is discussed in a 1977 article entitled *Modern Medicine's Shortcomings: Can We Really Conquer Disease?* that states,

“Modern medicine holds to an essentially deterministic and mechanistic view of disease, in which the individual has no control over his disease and consequently must submit himself to the intervention of an external agent.”

Although this view of disease is in accordance with the beliefs that underpin the practices of modern medicine, it too is fundamentally flawed.

It is clear therefore, that there are many genuine gaps in the knowledge the medical establishment claims to possess about disease, whether infectious or noncommunicable; however, it is generally believed that these knowledge gaps will be closed when sufficient information has accumulated as the result of medical research. But this is a mistaken belief; these gaps will not be closed by research conducted within a medical system that operates from the basis of an inadequate understanding of the fundamental nature of the problem it is studying.

Diseases are claimed to be identifiable by their signs and symptoms, but a number of diseases, especially those referred to as ‘infectious’, are associated with the same symptoms; fever, cough, fatigue and diarrhoea, for example, are common to many of them. The treatment of these conditions involves the use of medicines to alleviate the patient’s symptoms, on the basis that the cessation of symptoms means that the disease has been defeated. If their symptoms fail to respond to this initial treatment, it may be suggested that the patient should undergo certain tests that will enable a more accurate diagnosis of the disease and lead to more effective treatment. The fact that such tests may need to be conducted in order to correctly identify a patient’s disease, would seem to contradict the claim that diseases have recognisable signs and symptoms; many of them clearly do not.

The study of disease is conducted within the scientific field of pathology, the establishment definition of which is,

“the study of disease processes with the aim of understanding their nature and causes.”

This is, however, rather misleading; a process involves actions, but pathology is the study of effects, not actions; as indicated by the definition, which continues with the statement that,

“This is achieved by observing samples of blood, urine, faeces and diseased tissue obtained from the living patient or at autopsy by the use of X-rays and many other techniques.”

The study of samples of this nature involves a variety of preparation procedures to facilitate their observation under a microscope. The nature of these procedures is described by Dr Harold Hillman in his previously cited 2011 article entitled *Cell Biology at the Beginning of the 21st Century is in Dire Straits*, which bears repetition,

“When a tissue is prepared for histology, histochemistry, electron microscopy, or immunochemistry, an animal is killed; the tissue is excised; it is fixed or frozen; it is embedded; it is sectioned; it is rehydrated; it is stained; it is mounted; it is radiated by light, or bombarded by electron beams.”

Although this refers to the study of animal tissue, the same, or very similar, procedures are employed in the study of diseased tissue obtained from a human patient, but these procedures, as well as the chemicals used as stains and fixatives, directly affect the tissue samples, which are clearly no longer alive when observed. Furthermore, the laboratory apparatus and the laboratory itself are sterile environments that bear no resemblance whatsoever to the natural environment of the tissue samples within the human body, from which they have been removed. Unfortunately, as discussed in chapter three, researchers are mostly oblivious of the extent to which their preparation procedures affect the samples they study.

It is acknowledged by some researchers that there are certain limitations to laboratory studies of this nature and to the conclusions that can be drawn from them with respect to their relevance to human disease; this is, however, a gross understatement. The changes to tissue samples produced by both the environment in which they are studied and the procedures to which they are subjected, are of such a profound nature that they raise serious questions about the ability of such studies to ascertain any useful information about the nature or causes of human disease.

This problem is compounded by the fact that the medical establishment operates according to a mechanistic view, on the basis of which it is believed that each disease is unique and

identifiable by the specific effects it produces within the human body, which is also claimed to function mechanistically. If the mechanistic view were correct, the effects of each disease would be uniform and predictable, and all patients diagnosed with the same disease would exhibit exactly the same symptoms. Similarly, patients with the same disease would all respond in exactly the same manner to the same treatments, whether medicines or vaccines. But this does not reflect reality; in the real world, there is a great deal of variability, not only in the nature and severity of the symptoms exhibited by people diagnosed with the same disease, but also in people's responses to the same medicines; there is also a wide variability in people's reactions to vaccines. It is clear therefore, that the mechanistic view completely fails to represent an accurate description of the nature of disease or the functions of the human body.

Although the vast majority of disease research studies have been conducted with non-living samples, a few have been conducted with living specimens and these have generated some useful insights. The most significant insight, which has been gained from the study of cells and bacteria in particular, is the extent to which these living specimens can be affected by their environment.

As previously discussed, bacteria have demonstrated the ability to change their form in response to changes in their environment; a phenomenon known as pleomorphism. Living cells also respond to the condition of the environment in which they are placed, as demonstrated by Dr Bruce Lipton who describes his experiments with living cells in his book entitled *The Biology of Belief* and states that,

“When I provided a healthy environment for my cells they thrived; when the environment was less than optimal, the cells faltered. When I adjusted the environment, these ‘sick’ cells revitalized.”

The effect of the environment on human health has also been recognised by the medical establishment in the previously cited *Healthy Environments* report.

The ‘environment’ referred to is clearly the ‘external’ environment; but the health of living organisms is also affected by the condition of their ‘internal’ environment. All substances and influences that have

the ability to adversely affect any aspect of the environment, whether internal or external, will adversely affect the health of the living organisms exposed to them. It is clear therefore, that harmful substances and influences not only contribute to ill-health, but, in reality, are some of the main causes of disease.

It is not the purpose of this section to discuss the causes of diseases, which are discussed later in the chapter; the ensuing discussion examines the real nature of the phenomenon known as 'disease'.

The philosophical principle known as Ockham's razor proposes that, when faced with different explanations about a phenomenon, the simplest one that contains the least number of assumptions is the one that is most likely to be correct. This principle will therefore be applied to the different explanations of 'disease', to determine which of them is the most appropriate to this phenomenon.

The first explanation to be examined in more detail is that of 'modern medicine', which, according to the establishment definition, describes 'disease' as,

“any bodily abnormality or failure to function properly...”

Although seemingly simple, this description is based upon the underlying belief that each bodily abnormality or malfunction is indicative of a unique disease entity that has attacked the body, and produced the signs and symptoms by which it can be identified. But, although claimed to be true, this belief represents a collection of assumptions including the notion that there are many hundreds, if not thousands, of different diseases that each affect the body in a specific manner and produce recognisable signs and symptoms.

It is indisputable that people can and do experience varying combinations of symptoms, but the existence of different symptom-complexes, together with the fact that each has been assigned a specific label, do not constitute irrefutable evidence of the existence of unique disease entities. As previously discussed, there is a great deal of variability in the nature and severity of the symptoms that people diagnosed with the same disease can experience; this variability poses a serious challenge to the assumption that each disease produces distinct and easily recognisable symptoms.

The medical establishment claims that disease exists in two forms; that they can be either infectious or non-infectious, although the latter are usually referred to as noncommunicable. The idea that certain diseases are infectious is based on the theory that pathogenic microorganisms invade and infect the body thereby causing disease; this theory also claims that 'germs' are transmissible between people. It is generally asserted by proponents of modern medicine that this theory has been established beyond any doubt, but this is not the case. As previously discussed, the explanations about infectious diseases contain many anomalies, one of which is that 'infection' is not always accompanied by symptoms; another is that 'infection' is not always followed by disease. Yet another anomaly is that infected people do not always transmit their 'germs' to others. These anomalies remain unexplained; they therefore challenge the underlying assumptions of the theories pertaining to 'infectious diseases'.

In addition, many other aspects of these diseases also remain unexplained; for example, the medical establishment provides no explanations of the mechanisms by which microorganisms are able to cause disease, or the mechanisms by which they are able to induce a range of symptoms that vary widely in severity, and can even cause death. The failure to explain these mechanisms poses yet another direct challenge to the veracity of the claim that microorganisms cause disease.

These challenges, as well as the discussions in chapter three, provide a clear refutation of the 'germ theory' and repudiate the existence of the phenomenon referred to as an 'infectious disease'.

The explanations about noncommunicable diseases (NCDs) are acknowledged to contain many unknown and poorly understood aspects, but they too, contain a number of assumptions. One of these assumptions is that 'genetic factors' play a major role in increasing the risk that a person will develop or die from an NCD; in other words, it is claimed as a fact that people with certain genes have a 'genetic predisposition' to develop a specific disease such as cancer, for example. But this is not a fact; the idea that genes are determining factors has, as previously discussed, been proven to be unfounded by the Human Genome Project.

The idea that genetic factors determine a person's state of health has also been disproven by research in the field of epigenetics, which Dr Lipton discusses in *The Biology of Belief*. He explains that genes do not control biology, which means that people do not have a 'genetic predisposition' to any disease, and states that,

“In the last decade, epigenetic research has established that DNA blueprints passed down through genes are not set in concrete at birth. Genes are not destiny.”

Despite the importance of these new research findings, the WHO has failed to amend the fact sheet about NCDs, the June 2018 version of which continues to claim that these diseases can result from a combination of factors that include 'genetic factors'.

Although individual NCDs were discussed in chapter seven, it is possible for people to be affected by more than one of these chronic conditions. The co-occurrence of two or more chronic conditions in the same patient is a phenomenon known as multimorbidity, which is acknowledged to be increasing in incidence, as indicated by a 2016 article entitled *Multimorbidity: What do we know? What should we do?* that states,

“The number of people affected by multiple chronic diseases (multimorbidity) is increasing dramatically around the world...”

The growing prevalence of multimorbidity has also been recognised in a 2016 WHO report entitled *Multimorbidity* that states,

“People living with a long-term condition often have multiple rather than a single condition. Such multimorbidity is common and has been rising in prevalence over recent years.”

This statement is highly significant as it contradicts the most recent Global Burden of Disease (GBD) report of 2017, which asserts that people around the world have been experiencing improved health. A November 2018 editorial in *The Lancet* entitled *GBD 2017: a fragile world* claims that the GBD reports for the previous ten years have,

“...portrayed an ever-healthier world.”

The explanation in the 2016 WHO report for the increased incidence of multimorbidity is that it is related to increased life-expectancy, because it is a phenomenon that occurs more frequently in people over the age of 65; yet the report also states that,

“...the absolute number of people with multimorbidity has been found to be higher in those younger than 65 years...”

However, although it may be more common in people of advanced years, multimorbidity is not an inevitable consequence of ageing.

The medical establishment admits to the existence of knowledge gaps with respect to individual chronic conditions; it is therefore unsurprising that there are gaps in their knowledge about multimorbidity. These gaps are recognised by The Academy of Medical Sciences in a 2018 report entitled *Multimorbidity: a priority for global health research*, which will be referred to as the AMS report, that states,

“While it is generally accepted that multimorbidity is an increasing global health challenge, there remain massive gaps in our knowledge.”

Part of the reason for the existence of these knowledge gaps is claimed to be due to insufficient research, as the report also states,

“Research into multimorbidity in younger adults and those living in low- and middle-income countries is particularly lacking.”

Whilst a lack of research certainly hinders an understanding about the extent of the problem, increased research will not help to explain the reason for its existence, nor will it help to solve the problem, mainly because it will not result in the medical establishment altering its typical approach towards the treatment of disease.

Patients diagnosed with a single chronic condition are prescribed the medicine deemed to be the appropriate treatment for that condition. Patients diagnosed with multiple chronic conditions are therefore prescribed multiple medicines, each of which is deemed to be the appropriate treatment for each of their diseases; the use of multiple medicines to treat multiple conditions is referred to as polypharmacy. However, as previously discussed, all medicines are known to produce unintended adverse effects; this means that patients who take multiple medicines will invariably experience multiple adverse effects; a fact that is acknowledged in a March 2015 *BMJ* editorial entitled *Guidelines, polypharmacy and drug-drug interactions with multimorbidity* that states,

“One common consequence of polypharmacy is the high rate of adverse drug reactions...”

Furthermore, people diagnosed with multimorbidity can suffer from varying combinations of different chronic conditions, as the AMS report states,

“While there are limited data about the most commonly occurring clusters of conditions, it is accepted that multimorbidity is highly heterogenous and patients can experience a wide array of different combinations of conditions.”

Patients with multimorbidity are treated with varying combinations of different medicines, each of which is claimed to have the ability to target, and therefore correct, the bodily abnormality or malfunction associated with each disease. But this claim is unfounded; the effects that a medicine can induce can occur in many different parts of the body, they are not restricted to the specified target site. The use of multiple medicines can therefore result in multiple effects in multiple parts of the body; as the previously cited 2015 *BMJ* article states,

“Drugs have a network of effects that go well beyond a specific drug target, particularly in patients with multimorbidity.”

The main problem is that pharmaceuticals are almost entirely untested for their efficacy, safety or potential adverse effects in the multiple combinations that may be prescribed to patients with multiple chronic conditions, as the AMS report explains,

“Although all medicines are rigorously tested, clinical trials for particular medical conditions don’t usually include patients suffering from other conditions – which means there isn’t a bank of good evidence showing how different medicines work together in patients suffering from multimorbidity.”

One of the reasons that the vast majority of drug combinations remain untested is suggested by a 2018 article entitled *Artificial intelligence helps Stanford computer scientists predict the side effects of millions of drug combinations*, which admits that,

“Millions of people take upward of five medications a day, but testing the side effects of such combinations is impractical.”

The ‘impracticability’ of conducting such extensive tests means that patients diagnosed with multimorbidity will have little, if any,

information about the full range of potential ‘side effects’ they may experience, as the result of the particular combination of multiple medicines they have been prescribed as treatment for their particular combination of multiple chronic conditions.

Multiple medicines are also used in the treatment of a single disease; the recommended treatment of TB for example, involves the use of multiple antibiotics. This phenomenon, referred to as ‘polypharmacology’, is also increasingly common. The reason that multiple drugs are deemed to be necessary for the treatment of a single condition is explained by a 2014 article entitled *Systematic prediction of drug combinations based on clinical side-effects*, which states that a single drug,

“...sometimes shows limited efficacy, especially for complex diseases...”

Some of the most common diseases for which multiple drugs are used, because a single drug shows ‘limited efficacy’, are those said to be caused by bacteria. The reason that a single antibiotic drug is not effective is claimed to be because the bacteria have developed ‘resistance’ to it; but the use of multiple antibiotics is not necessarily more effective, as indicated by the phenomenon of MDR-TB (multidrug-resistant TB). However, bacteria are not the only microorganisms claimed to have developed ‘drug resistance’, which is perceived to pose a dire threat to health; as indicated by the February 2018 WHO fact sheet entitled *Antimicrobial resistance* that claims this to be,

“...an increasingly serious threat to global public health...”

This claim is misleading for reasons discussed in chapter three.

The discussions presented within this book show that the explanations of disease promulgated by the medical establishment are fraught with problems of such a profound nature, that they challenge the veracity of the underlying theories, and raise doubts as to whether these explanations can be considered to fulfil the criteria of Ockham’s razor as the most likely to be correct. These problems inevitably raise the further question of whether another explanation of disease exists that is better able to fulfil these criteria.

The forms of healthcare that operate outside of the ‘mainstream’ are commonly referred to as ‘complementary and alternative

medicine' (CAM), but proponents of 'modern medicine' invariably dismiss these as 'unorthodox', and refer to them using such derogatory terms as unscientific, pseudo-science, pseudo-medicine or quackery.

These CAM healthcare systems incorporate a wide variety of different practices, but often adopt a similar approach; for example, many employ the use of 'natural' substances as medicines and treat the patient rather than the disease. Whilst this approach may be considered preferable to that of the medical establishment, it is nevertheless dependent upon the same underlying theories, which are: that there are many distinctly different diseases; that certain diseases are caused by 'germs'; and that people affected by disease can only recover their health through treatment with some form of medicine. But these theories are flawed; any healthcare system that adopts an approach based on them will clearly be subject to the same, or at least very similar, problems as those encountered by the medical establishment. These systems are therefore, unable to furnish a more credible explanation of 'disease' than that of the medical establishment.

There are, however, 'non-mainstream' healthcare systems that operate from the basis of a different approach towards disease, its causes and treatment. The most notable of these is Natural Hygiene, which was developed during the 19th century. Although some of the early practitioners were qualified medical doctors, the pioneers of Natural Hygiene rejected the approach adopted by modern medicine, especially with respect to the use of 'medicines', which they recognised to be toxic, and with respect to the study of disease within the confines of the laboratory, as Herbert Shelton, a lifelong practitioner of Natural Hygiene, explains,

"Its modern pioneers were brilliant men who were not afraid to depart from the ruts of orthodoxy and search for truth in despised places, but they were not men of the cloistered laboratory."

In their search to understand the real nature of disease, these men studied the 'laws of nature' and the application of these laws to human health. The studies these pioneers conducted over the course of many years, led them, and many who followed them, to the

understanding that 'disease' is not an entity that attacks the body and needs to be fought and destroyed through the use of toxic 'medicines'. Their departure from orthodoxy, although earning derision from their contemporaries engaged in 'modern medicine', enabled them to develop a very different understanding of the nature of the human body, which they recognised to be a living organism that functions holistically in accordance with 'laws of nature'. They also discovered that anything that disrupts the body's functions will have a detrimental impact on health, as Herbert Shelton explains,

“The human organism is an indivisible whole and anything that tends to interfere with the unity of its structure or the unity of its function becomes a factor in the causation of disease.”

The explanation of disease presented by Natural Hygiene can therefore be articulated as follows: 'disease' represents disruptions to the body's ability to function properly, and 'symptoms' are the manifestation of the body's responses to the presence of harmful substances and influences that include actions to expel toxins, repair damage and restore the body to its natural state of health.

The credibility of this new explanation can be demonstrated by reference to two symptoms, namely vomiting and diarrhoea. According to the medical establishment view, these symptoms are indicative of a 'disease' that is often, but erroneously, attributed to 'germs'. Yet no explanation is offered for the mechanism by which pathogens are able to cause these symptoms, the severity of which can vary widely. Such symptoms are however, perfectly explicable within the context of the new explanation of disease, as the body's responses to the presence in the digestive system of harmful substances and its efforts to expel them, as Herbert Shelton explains,

“A poison is taken into the stomach; the organism senses the presence of a non-usable and harmful substance and prepares to act accordingly. It is sent out by vomiting, or it is sent along the digestive tract into the colon and is expelled by means of a violent diarrhea.”

The digestive system is clearly not the only part of the body that can be affected by harmful substances that need to be expelled; toxic materials can also enter the body through inhalation, absorption

through the skin or injection, both intradermal and intramuscular. The route by which toxins enter the body will determine the tissues and organs that will be affected, and the nature of the responses the body will produce to expel them. Air pollutants, for example, which are inhaled, will have a greater impact on the respiratory system. The body's efforts to expel inhaled toxins will include symptoms such as sneezing and coughing, which are amongst the symptoms typical of respiratory 'diseases' such as asthma; the association between the inhalation of toxic irritants and asthma was discussed in chapter seven.

As the discussions in chapter six made perfectly clear, there are a huge number and wide variety of harmful substances and influences to which people are exposed in varying combinations on a daily basis; but these 'poisons' are not always or immediately expelled in such a simple manner as those that enter the digestive system. Some toxic substances, such as dioxins for example, bioaccumulate and are therefore more difficult to expel. But this does not mean that the body is powerless to expel toxins of this nature; on the contrary, the body possesses many self-protective mechanisms, as Herbert Shelton explains,

“When poisonous matter has accumulated in the system to the point where it becomes a menace to life, the body makes a violent effort to cast it out and we have pain, inflammations, fevers, and the whole train of acute diseases.”

The use of the term 'acute diseases' in the above statement should not be construed as confirmation of the existence of distinctly different types of disease, for this is not his intended meaning. Instead, this term is used to represent short-lived conditions that are accompanied by self-limiting symptoms such as fever, sneezing, coughing, vomiting and diarrhoea, all of which are clearly indicative of the body's response to the presence of harmful substances and influences, and its efforts to expel them. As Herbert Shelton explains, the term 'acute disease' refers to,

“...vital action in some one or all of the living tissues or organs in resisting and expelling injurious substances and influences and in repairing damages.”

When the body has expelled the 'injurious substances', these vital actions, or symptoms, will subside and then cease; but the cessation of symptoms should not be interpreted to indicate that all toxic materials have been eliminated from the body. The body constantly seeks to attain and maintain itself in the state of 'health', the vital actions necessary to expel toxins, repair damage and restore health are therefore ongoing processes that continue throughout life, as Herbert Shelton explains,

"The struggle of the system to cast out its accumulated toxins continues so long as the organism remains alive."

It should be clear therefore, that the greater the level of accumulated toxins in the body, the greater the effort required to eliminate them; toxins and their elimination are discussed in more detail later in this chapter.

Unfortunately, the body's vital actions in resisting and expelling harmful substances are interpreted as symptoms that need to be 'cured' through the use of medicine. However, pharmaceuticals, as well as a number of 'natural' medicines, contain substances that the body recognises as harmful and therefore need to be expelled through the appropriate vital actions; but these actions are then interpreted as symptoms of yet another disease that needs to be cured. This inevitably leads to a vicious cycle of diseases and 'cures'; a cycle that results in a progression from a series of 'acute diseases' to more serious conditions, usually referred to as 'chronic diseases', as Herbert Shelton explains,

"A child frequently develops colds. It develops sore throat, tonsillitis, bronchitis, pneumonia, all of which are cured, and soon followed by another cold, another tonsillitis, another bronchitis, and this process continues until chronic disease of the lungs evolves."

Chronic diseases are invariably of a longer duration and indicative of a far more serious health problem than acute diseases; they are therefore associated with very different symptoms, most of which do not represent obvious efforts to expel toxins, but they do represent the body's efforts to protect itself, repair damage and restore health. This means that the 'new' explanation of disease is equally applicable to chronic conditions, the symptoms of which are

indicative of disruptions to the body's ability to function properly; cardiovascular diseases, for example, are a group of chronic conditions that represent dysfunctions within the cardiovascular system.

The real functions of the symptoms associated with chronic conditions can be demonstrated by the example of inflammation, which is acknowledged to be the body's response to injury, but is erroneously claimed by the medical establishment to be a main cause of many chronic conditions, including major NCDs. Inflammation is claimed to be a serious symptom that needs to be suppressed with anti-inflammatory drugs such as NSAIDs; but this course of action is based on a mistaken understanding of the role of inflammation. In addition to being the body's response to injuries and wounds, inflammation is also one of the mechanisms by which the body repairs damage; it is described by Herbert Shelton as 'remedial action'. The purpose of inflammation in both injury and disease is to provide the affected area with an increased supply of repair materials through an increased supply of blood. When the damage has been repaired, the blood supply returns to normal and inflammation ceases; the continuing presence of inflammation indicates that the damage has not been fully repaired, but it can be prolonged for other reasons, as discussed later in this section.

It has been demonstrated in many of the discussions in this book that pharmaceuticals are inherently toxic due to the nature of some, if not all of their ingredients; but this toxicity is virtually always intentional, the main purpose of the 'active' chemical ingredients of pharmaceuticals is to defeat disease or kill germs. Nevertheless, despite their toxicity, pharmaceuticals are credited with the ability to restore health. It should be noted that many 'natural' medicines, which are similarly credited with the ability to restore health, also contain toxic ingredients.

One of the main reasons that medicines, whether pharmaceutical or natural, are claimed to successfully achieve their intended purpose, is because people report that their symptoms reduced in severity, and even ceased entirely after they had taken the 'medicine'. They therefore attribute their 'recovery' from illness to the actions of the medicine; but this attribution is misplaced. No

medicine possesses the ability to heal the body; the only 'agent' that does possess this ability is the body itself. The recovery from illness is solely due to the body's innate self-healing mechanisms, as Herbert Shelton explains,

“It is these processes of resistance and expulsion and the processes by which damages are repaired that are mistaken for the actions of drugs.”

The most significant departure from orthodoxy of the early practitioners of Natural Hygiene was the rejection of the foundational beliefs on which 'modern medicine' is based, especially the belief that medicines cure disease. It is particularly notable that many of these practitioners were medical doctors who had obtained their qualification through the mainstream medical system, but rejected that system when they recognised its failings. Their studies led them to discover that obedience to the 'laws of nature' was the only effective method by which health could be attained, and they therefore incorporated this approach into their treatment of patients. In his book *Toxemia Explained*, Dr John Tilden MD refers to his experiences of using and then eschewing the use of 'medicines'; his words, which were cited in chapter one, bear repetition,

“Twenty-five years in which I used drugs, and thirty-three in which I have not used drugs, should make my belief that drugs are unnecessary and in most cases injurious, worth something to those who care to know the truth.”

It is appropriate to therefore examine the explanation of disease presented by Natural Hygiene in the context of the criteria of Ockham's razor. As stated earlier, this 'new' explanation states that 'disease' represents disruptions to the body's ability to function properly, and that 'symptoms' are the manifestation of the body's responses to the presence of harmful substances and influences that include actions to expel toxins, repair damage and restore the body to its natural state of health.

In addition to its simplicity and lack of assumptions, this 'new' explanation dispels the many anomalies raised by the medical establishment explanation; for example, the varying nature and severity of the symptoms experienced by people alleged to have the same disease is no longer an anomaly because people do not have

the same disease. Each person experiences differing symptoms that are manifestations of their body's response to the conditions within their 'inner environment'; as discussed in the later sections about the causes of 'disease'. Furthermore, this 'new' explanation of disease does not depend on assumptions about unknown processes, such as the mechanisms by which 'germs' are able to induce a wide variety of symptoms.

It is clear that this 'new' explanation of disease is the simplest and the one with the least number of assumptions; it therefore qualifies, in accordance with Ockham's razor, to be the one that is most likely to be correct. The veracity of this explanation is not only 'likely', but can be shown to be fully in accordance with a large and growing body of scientific evidence, as will be demonstrated.

It should be noted that, although the 'new' explanation of disease presented by Natural Hygiene forms the basis of the discussions in this chapter, this book presents a few differences with respect to some of the details. For example, the discussions in this book have demonstrated that 'germs' play no role whatsoever in disease, whereas the proponents of Natural Hygiene suggest that they may play a secondary, albeit minor role. In addition, the discussions in this final chapter provide a fuller explanation of the nature of disease, as well as the processes involved; they also include reference to all of the factors that contribute to the development of disease.

This 'new' explanation of disease, although highly controversial because of its divergence from orthodoxy, is corroborated by the findings of scientific research into the processes involved in virtually all diseases. One of its main assertions is that individual disease entities do not exist; that what have traditionally been referred to as different 'diseases' are, in reality, different expressions of an underlying disruption to the body's normal functions that manifest as a variety of different symptoms. Although the idea that there are no distinct disease entities may also be regarded as controversial, it is nevertheless corroborated by a growing body of evidence that demonstrates all 'diseases' share a common underlying mechanism. This common mechanism is oxidative stress; as indicated by a June 2000 article entitled *The Evolution of Free Radicals and Oxidative Stress*, which states that,

“Perhaps the most noteworthy observation concerning the role of oxidative stress in human disease is the commonality of it.”

Free radicals are produced by the body’s normal processes, including cell metabolism; but these molecules have unpaired electrons, which makes them highly reactive and potentially dangerous because, if not reduced by antioxidants, they can cause serious damage to the surrounding cells. The existence in the body of oxidative stress indicates the presence of an excessive level of free radicals that have begun the process of damaging the body’s cells; it should be noted that cellular damage is also a common feature of ‘disease’.

The growing body of research that has found oxidative stress to be the common underlying mechanism, although with different manifestations, of most, if not all noncommunicable diseases, is demonstrated by a 2014 article entitled *Introduction: oxidation and inflammation, a molecular link between non-communicable diseases*, which states that,

“Recent investigations show that many of these diseases share common pathophysiological mechanisms and are, at least in part, different manifestations in different organs of similar molecular alterations.”

Pathophysiology is the study of functional changes that occur as the result of disease.

The article also states that,

“Mitochondrial alterations, oxidative stress and inflammation are inextricably linked and play major roles in the onset and development of non-communicable diseases.”

It should be noted that mitochondrial alterations, or dysfunctions, can occur as the result of oxidative stress and the ensuing free radical damage.

Inflammation is a significant aspect of many major NCDs, but it is not a causal factor as the medical establishment suggests. Instead, it is oxidative stress, which is the underlying mechanism common to virtually all NCDs, that causes inflammation; as indicated by a 2014 article entitled *The role of oxidative stress during inflammatory processes* that states,

“In recent years, evidence has emerged that oxidative stress plays a crucial role in the development and perpetuation of inflammation.”

As stated earlier in this section, inflammation may persist, especially within certain organs and tissues of the body where damage has occurred; but the reason that inflammation persists is because of the persistence of its underlying cause, namely oxidative stress.

The commonality of oxidative stress and free radical damage in NCDs also applies to cancer, as indicated by a 2014 article entitled *Inflammation, Free Radical Damage, Oxidative Stress and Cancer* that states,

“Tumor cells usually have an imbalanced redox status...”

Redox is the abbreviation of reduction-oxidation. Redox status is described as the balance between oxidants and antioxidants.

The discussion about cancer in chapter seven refers to the link between aneuploidy and cancer, in addition to which is a substantial volume of evidence that links aneuploidy and cancer to oxidative stress. This provides yet more evidence of the commonality of the processes and mechanisms involved in all conditions of ill-health, and further demonstrates the veracity of the ‘new’ explanation of disease.

Although oxidative stress is mainly associated with noncommunicable diseases, it has been recognised for more than two decades to also be associated with ‘infectious diseases’; as indicated by a 1995 article entitled *The role of oxidative stress in HIV disease*, which states that,

“Indications of oxidative stress are observed in asymptomatic HIV-infected patients early in the course of the disease.”

The medical establishment claims that one of the functions of free radicals is to defend the body against an attack by ‘pathogenic microorganisms’; but this claim is clearly erroneous. If it were correct, the co-existence of oxidative stress and ‘infection’ with HIV, or any other so-called ‘germ’, would not be possible, because the invading pathogen should have been destroyed by the free radicals. This is yet another anomaly within the context of the ‘germ theory’ of disease. This anomaly is, however, removed by reference to the

‘new’ explanation of disease, which excludes any reference to ‘germs’, but fully recognises the role of oxidative stress and free radical damage.

Oxidative stress has also been observed to occur in cases of infections alleged to be caused by parasites, as indicated by a 2012 article entitled *Involvement of free radicals in parasitic infestations* that states,

“Several studies have reported the presence of oxidative stress in humans and animals infected with parasites...”

These ‘infestations’ include the parasites alleged to be the cause of malaria, as indicated by a 2012 article entitled *Oxidative Stress in Malaria*, which admits to the existence of yet another knowledge gap in the statement that,

“Despite the significant effort to eradicate this dangerous disease, lack of complete knowledge of its physiopathology compromises the success in this enterprise.”

Both of these articles claim that oxidative stress is caused by the ‘infections’, but this is clearly a complete contradiction of the claim that the purpose of free radicals is to defend the body against ‘infection’. Furthermore, despite the assertion that ‘infections’ cause oxidative stress, the medical establishment does not understand the mechanisms involved, as indicated by a 2017 article entitled *Oxidative stress in infection and consequent disease*, which refers to ‘overwhelming evidence’ of the existence of oxidative stress in many ‘infectious diseases’ but states that,

“...the impact of the majority of infectious agents on the host redux systems is not sufficiently characterized, with published data plagued by controversies.”

Unfortunately, these controversies will persist whilst the medical establishment continues to believe that microorganisms are pathogenic.

Another particularly significant discovery is that oxidative stress, with the resulting free radical damage, is the common mechanism by which all of the ‘substances and influences’ that cause disease produce their harmful effects. The association between toxic substances and oxidative stress was recognised more than two

decades ago, as indicated by a 1995 article, entitled *The role of free radicals in toxicity and disease*, which explains that,

“The toxicity of many xenobiotics is associated with the metabolic activation of foreign compounds to form free radicals...”

Xenobiotics are substances that are foreign to the body; a term that is commonly used to refer to synthetic chemicals, including pharmaceuticals.

The inclusion of pharmaceuticals in the category of ‘xenobiotics’ provides further corroboration of the assertion that the body recognises ‘medicines’ as ‘foreign compounds’ that are toxic and therefore need to be expelled. The assertion that pharmaceuticals are damaging rather than health-promoting is also substantiated by the acknowledgement that they produce the same mechanism by which all toxins cause damage. In other words, pharmaceuticals also increase the generation of free radicals; as indicated by the above cited article about malaria, which states that the drugs used in the treatment of the disease,

“...are inducers of free radical production.”

Although free radicals are produced by normal metabolic functions, the body has innate mechanisms to protect itself against free radical damage; as indicated by a 2008 article entitled *Free Radicals, Antioxidants in Disease and Health* that states,

“The human body has several mechanisms to counteract oxidative stress by producing antioxidants...”

However, in order for these protective mechanisms to function properly, the body must be provided with all of the materials these mechanisms require. Although many antioxidants are obtained from the diet, some are also produced endogenously; but they are both necessary to protect the body from free radical damage, as the article states,

“Endogenous and exogenous antioxidants act as ‘free radical scavengers’ by preventing and repairing damages caused by ROS and RNS...”

ROS are reactive oxygen species and RNS are reactive nitrogen species.

The discussion in this section has demonstrated that 'disease' is not an entity that attacks the body, but represents dysfunctions within the body that have the same underlying mechanism. This unity of 'disease' can therefore be shown to be fully consistent with what has been referred to as the 'new' explanation of disease, but, in reality, should now be recognised to represent the real nature of disease, and therefore be the only explanation.

However, although the body is perfectly capable of maintaining itself in a state of health, the innate self-protective and self-healing mechanisms it employs can only be fully effective when they are supported by observing the 'laws of nature'. These 'laws' require that, where possible, exposures to harmful substances and influences should be avoided or minimised if complete avoidance is not possible. In addition, these 'laws' require that attention is paid to the substances consumed as food; the importance of 'nutrition' cannot be overstated.

The laws of nature can only be followed with sufficient knowledge about the factors that support health, so that they can be increased, and the factors that impede health, so that they can be avoided. These factors are the topics of the remaining sections of this chapter, after a brief discussion about the role of 'physical activity'.

Fitness & Exercise

The February 2018 WHO fact sheet entitled *Physical activity* states that,

“Insufficient physical activity is one of the leading risk factors for death worldwide.”

In addition, one of the 'key facts' is claimed to be that,

“Globally, 1 in 4 adults is not active enough.”

These are extremely bold claims, especially in view of the fact that the vast majority of the world population live in countries that are acknowledged to have poor health data collection systems.

The concern of the WHO about the low level of physical activity amongst the adult population, is based on the idea that 'physical inactivity' increases the risk of developing and dying from an NCD, as the fact sheet states,

“Insufficient physical activity is a key risk factor for noncommunicable diseases (NCDs) such as cardiovascular

diseases, cancer and diabetes.”

Whilst a low level of physical activity may have been observed to correlate with a diagnosis of an NCD, this does not prove the existence of a causal relationship. The discussion in the previous section showed that oxidative stress is the underlying mechanism of all types of disease, especially chronic diseases.

Despite the attempt to promote the idea that a causal link exists, there is no evidence that physical inactivity alone produces oxidative stress or causes any NCD. Nevertheless, on the basis of the claim that a causal relationship does exist, the medical establishment has increased its efforts to promote the health benefits of increased physical activity. A major part of this effort is the launch of a WHO-led initiative called *The Global action plan on physical activity 2018-2030* that includes a June 2018 report entitled *More Active People for a Healthier World*, which expands on the information in the fact sheet and states that,

“All forms of physical activity can provide health benefits if undertaken regularly and of sufficient duration and intensity.”

It is not disputed that there are benefits to be gained from a certain level of physical activity; these benefits include increased mobility, flexibility and stamina, all of which are aspects of ‘fitness’ that can improve overall well-being. But the WHO erroneously equates physical activity with health, as indicated by the fact sheet that claims,

“Physical activity has significant health benefits and contributes to prevent NCDs.”

The misleading nature of this claim can be demonstrated by the numerous examples of athletes who have tragically succumbed to, and even died from CVDs and cancers, the two major noncommunicable diseases. Most significantly, a substantial number of these athletes died at a very young age, often in their 20s or 30s; their high level of physical activity clearly failed to provide them with significant health benefits or prevent their premature death.

The sudden and unexpected death of an adult is a recognised phenomenon known as ‘sudden cardiac death’ (SCD), which is defined by a December 2016 article entitled *A Clinical Perspective on Sudden Cardiac Death* as,

“...death due to cardiac causes occurring within 1 hour of the onset of symptoms.”

The article discusses the rate of ‘sports-related death’ in the general population, but adds the comment that,

“The sports-related sudden death rate is higher in elite athletes...”

Unfortunately, the article fails to explain why elite athletes experience a higher rate of sudden death from cardiac problems than the general population; but this finding directly contradicts the WHO claim that physical inactivity, rather than physical activity, increases the risk of dying due to a cardiac problem.

Although previously discussed, it is important to reiterate that the heart functions electrically, as acknowledged by the NHLBI (National Heart, Lung, and Blood Institute) web page entitled *Sudden Cardiac Arrest*, which states that,

“The heart has an electrical system that controls the rate and rhythm of the heartbeat. Problems with the heart’s electrical system can cause irregular heartbeats called arrhythmias.”

Interestingly, the above cited December 2016 article about Sudden Cardiac Death states that,

“SCD with negative pathological and toxicological assessment is termed ‘sudden arrhythmic death syndrome’.”

As previously discussed, ‘sudden death’ is not a syndrome.

The adverse health effects of the ‘unnatural’ EM radiation produced by all electrical devices, electronic equipment and wireless communications have been discussed, and will be further discussed later in this chapter; but it is important to emphasise the failure of the medical establishment to acknowledge the serious health hazards of exposures to electromagnetic radiation at levels far below that at which heating occurs.

The NHLBI web page makes an extremely interesting comment that there is no requirement for a pre-existing condition in cases of sudden cardiac arrest (SCA), which, it states,

“...can happen in people who appear healthy and have no known heart disease or other risk factors for SCA.”

The absence of a pre-existing heart condition raises the inevitable question of what is the real cause of these sudden cardiac problems

and sudden deaths.

It is obvious that there remain many significant knowledge gaps in the understanding the medical establishment claims to possess about 'sudden' cardiac problems, and in particular, the phenomenon of sudden death in otherwise healthy young adults; especially athletes who were obviously extremely 'physically active'. This phenomenon is however, entirely explicable from the perspective of the 'new' explanation of disease and an understanding of human biology with particular reference to the body's normal processes. One of the body's key processes is metabolism, which the establishment defines as,

“the sum of all the chemical and physical changes that take place within the body and enable its continued growth and functioning.”

As previously discussed, normal metabolic processes involve the generation of free radicals; however, as Dr Russell Blaylock explains in *Health and Nutrition Secrets*, physical activity increases the rate of metabolism, which, in turn, increases the generation of free radicals and, as he states,

“...the number of free radicals generated during exercise depends on the intensity of the exercise and its duration.”

He also explains the consequences of substantially raising the duration and intensity of physical activity,

“It is now known that intense exercise dramatically increases free-radical production and lipid peroxidation.”

A dramatic increase in the production of free radicals can lead to oxidative stress and cause free radical damage, the underlying mechanism that is recognised to be common to virtually all types of 'disease', including those that affect the cardiac system.

Free radical damage is not an inevitable consequence of all forms of physical activity; it will only occur in the absence of an adequate level of antioxidants that can neutralise them. Unfortunately, most people, including elite athletes, are unaware that increased physical activity should be accompanied by an increased intake of antioxidants. As Dr Blaylock explains, this lack of awareness means that, when they increase their level of physical activity,

“...most people do not correspondingly increase their antioxidant intake.”

Antioxidants are extremely important for providing protection against free radical damage, but they are not the only group of nutrients essential for health. Another extremely important nutrient is magnesium, a deficiency of which is also linked to cardiac problems, as Dr Carolyn Dean explains in *The Magnesium Miracle*,

“Magnesium deficiency may cause sudden cardiac death in healthy adults.”

It is clear therefore, that ‘fitness’ is not synonymous with ‘health’. Physical activity is beneficial, but it is vital that the body is in a state of ‘good health’ prior to an increase in the level of physical activity, otherwise, as this discussion has shown, it may be accompanied by serious health problems. Although an increased intake of nutrients, especially antioxidants, is an important aspect of ‘good health’, it is not the only factor to which people need to pay attention; as discussed in the remaining sections of this book.

The Four Factors

It has been asserted in previous discussions that conditions of ill-health are always the result of multiple factors; an assertion that is recognised, albeit to a limited extent, in the *Healthy Environments* report, which acknowledges that,

“...the root causes of ill health are multifactorial...”

The factors referred to in the report include many that cannot be described as ‘causes’; whereas those discussed in the remaining sections of this chapter have been proven to be causal factors, because they induce the underlying mechanism common to all diseases.

The medical establishment erroneously claims that the conditions of ill-health referred to as infectious diseases are caused by ‘biological factors’; in other words, pathogenic microorganisms. The conditions of ill-health referred to as noncommunicable diseases are, however, claimed to result from a combination of ‘risk factors’, which, according to the WHO fact sheet about NCDs, are genetic, physiological, behavioural and environmental.

A ‘risk’ refers to the possibility that an effect may occur, whereas a ‘cause’ is something that produces an effect; these terms are clearly

not synonymous. The term 'risk factor' is defined on the WHO web page entitled *Risk factors* that states,

"A risk factor is any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury."

The reason that the medical establishment refers to 'risk factors' rather than causes is due to their lack of knowledge about the exact causes of NCDs; but this 'knowledge gap' is due entirely to their lack of understanding about the nature of 'disease' and the functions of the human body. The lack of understanding about the latter can be demonstrated by the idea that 'genetic factors' pose a significant risk to health; as Dr Bruce Lipton explains in his February 2012 article entitled *Epigenetics*,

"Conventional medicine is operating from an archaic view that we're controlled by genes. This misunderstands the nature of how biology works."

The claim that 'environmental factors' contribute to ill-health cannot be disputed, although the medical establishment fails to acknowledge all of the relevant factors.

The subtitle of the *Healthy Environments* report is: *A global assessment of the burden of disease from environmental risks*. The purpose of the report is to identify the environmental factors associated with disease that are 'modifiable', so that interventions can be implemented to reduce the overall burden of disease. Unfortunately, many of the interventions used for the purpose of reducing disease exacerbate rather than solve the problem. One particularly pertinent example is the use of highly toxic pesticides for the purpose of eradicating vectors, especially mosquitoes, which are claimed to transmit parasites that are said to cause various diseases, such as malaria.

On the basis of the erroneous belief that 'diseases' are individual entities, the *Healthy Environments* report presents the results of its 'assessment' by reference to a number of diseases, each of which is considered separately in the effort to identify the specific 'environmental risks' with which that disease is associated. One of the listed diseases is 'asthma', a major determinant of which is erroneously claimed to involve 'genetic predisposition'. Although the

report correctly attributes a role to air pollution, it is only in the context that air pollution provokes and exacerbates asthma; which indicates that the condition already exists. It should be noted however, that many components of air pollution are known to cause oxidative stress and that a recognised association exists between oxidative stress and asthma.

Whilst the report acknowledges many 'environmental risk factors' that have been associated with various 'diseases', it fails to recognise the full range of hazardous substances and influences or the full extent of their adverse effects on the environment. One of the reasons that the report fails to include all of the relevant 'environmental factors' is claimed to be because their 'risk' has not been fully assessed; as indicated by the statement that,

"There are many examples of risks that have not been adequately evaluated, including the effects of emerging risks (e.g. more intensive agricultural practices and zoonoses), the effects of many longterm chemical exposures on cancers or endocrine disorders, and the impact of electromagnetic and other exposures from new technologies."

This statement is disingenuous; many of the risks associated with chemical and electromagnetic exposures have been evaluated and are known, as will be further discussed in this chapter; the main reasons that the medical establishment denies that they pose serious risks to health were discussed in chapter nine.

The 'new' explanation of the nature of 'disease' states that disruptions to the body's ability to function properly are caused by exposures to 'harmful substances and influences', although the body has innate mechanisms by which it can protect itself. However, the ability of these mechanisms to function properly and protect the body, can be compromised if exposures to 'harmful substances and influences' reach a substantially high level; which is precisely the predicament now faced by the vast majority of the world population.

It is, however, possible to improve this situation, but it requires people to have the necessary information to enable them to take the appropriate actions; these actions involve reducing exposures to harmful substances and influences, and require attention to be paid to everything that is supportive of health. All of the substances and

influences that affect human health, whether beneficially or otherwise, can be identified as belonging to one of four categories, which are referred to in the remaining sections of this chapter as ‘the four factors’; these are nutrition, toxic exposures, EM radiation exposures and stress.

Nutrition

The medical establishment acknowledges that ‘nutrition’ is important, but has a poor understanding of the full meaning of the term and of its importance to health. The WHO web page entitled *Nutrition* defines the term as,

“...the intake of food, considered in relation to the body’s dietary needs.”

The real meaning of nutrition refers to far more than is included in this definition, as this discussion will demonstrate.

Although the Oxford Concise Medical Dictionary defines ‘nutrition’ with reference to the intake of nutrients, it defines a nutrient as,

“a substance that must be consumed as part of the diet to provide a source of energy, material for growth or substances that regulate growth or energy production.”

This definition highlights one of the major, but erroneous, ideas promulgated by the medical establishment about nutrition, which is that the main purpose of food is to provide the body with ‘energy’; as also demonstrated by the WHO *Nutrition* web page, which defines ‘good nutrition’ as,

“...an adequate, well-balanced diet combined with regular physical activity...”

Physical activity is not a component of ‘good nutrition’. The reason for its inclusion in the definition is to promote the idea that an ‘adequate’ diet is one that provides sufficient calories to meet, but not exceed, the body’s requirement for energy to be expended in physical activity; as indicated by the WHO October 2018 *Healthy diet* fact sheet which claims that,

“Energy intake (calories) should be in balance with energy expenditure.”

A diet that is focused on the energy value of foods is not synonymous with a ‘healthy diet’, nor does it represent ‘good nutrition’. The claim that energy intake should balance energy

expenditure is based on the notion that an intake of calories that exceeds those expended in physical activity is the main cause of overweight and obesity; as indicated by the February 2018 WHO fact sheet entitled *Obesity and overweight* that states,

“The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended.”

Overweight and obesity are defined in the fact sheet by reference to the accumulation of body fat. But body fat does not accumulate solely as the result of an excess intake of calories; it is far more closely and causally related to the quality of the foods consumed. The fact sheet explains that overweight and obesity are determined by reference to a measurement known as BMI (body mass index). For adults, overweight is defined as a BMI between 25 and 30, whereas obesity is defined as a BMI of 30 or higher; the criteria for children are different and dependent on their age.

The most significant aspect of a high BMI is that it is associated with an increased ‘risk’ of developing an NCD; as indicated by the fact sheet that claims,

“Raised BMI is a major risk factor for noncommunicable diseases...”

The main NCDs associated with a high BMI are cardiovascular disease, diabetes and certain cancers, but these conditions are not caused by an excess intake of calories. In accordance with the ‘new’ explanation of disease, these conditions represent different manifestations of dysfunctions within the body, due to exposures to ‘harmful substances and influences’ that increase the generation of free radicals, induce oxidative stress and result in damage to the body’s cells and tissues.

The emphasis by the medical establishment on the energy value of foods is largely based on the mechanistic view of the body that promotes the idea that the human requirement for food is analogous to a vehicle’s requirement for fuel. But this is a false analogy; the human body is not mechanistic in nature. Although there is a need to consume foods that provide the necessary materials for conversion into energy, the human body is a living organism whose complex life-sustaining processes bear no resemblance whatsoever to the purely

mechanical functions of machines, including those produced using the most advanced technologies.

The fundamental purpose of eating is to provide the body with the necessary materials to support all of its processes, not merely those that involve the production of energy. Substances consumed as food should therefore contain those necessary materials, more commonly referred to as nutrients. This means that 'nutrition' should be more correctly defined as the intake of nutrients and their transformation into materials for utilisation in the body's biochemical processes that promote health and sustain life; as summarised by Herbert Shelton who explains that,

“To serve in any proper sense as food a substance must be capable of assimilation by the tissues; this is to say, the cells must be able to take it up from the blood stream and incorporate it into themselves and make it a normal constituent of cell substance and use it in the processes of life.”

Any substance that cannot be transformed into materials that the body can utilise is not a nutrient; a substance that is unusable by the body will be antagonistic to it and must therefore be regarded as a 'poison', as he also explains,

“Any substance that cannot be so appropriated by the cells and organized into living structure, this is to say, any substance that cannot be metabolized, is a poison.”

Although the WHO refers to good nutrition as 'a cornerstone of good health', it nevertheless fails to recommend policies that would make nutrition a cornerstone of healthcare. One of the reasons for this failure is due to the influence of vested interests, especially of the chemical, pharmaceutical and food industries, whose profitability would be threatened by increased public awareness of the true meaning of nutrition.

Furthermore, most members of the medical establishment are reluctant to improve their knowledge about 'nutrition' because, as previously discussed, the topic is considered to be 'unscientific', 'fluffy' and the 'realm of dieticians not doctors'. The perpetuation of this disparaging attitude is largely due to the virtual absence of nutrition courses in the curricula of most medical schools. This is, however a serious omission; understanding nutrition is fundamental

to an understanding of human health, which, according to the medical establishment, is the indisputable 'realm of doctors'. However, medical researchers do not understand health because they study 'disease', or more accurately, they study the effects of disease; but their investigations are based on an erroneous understanding of the nature of the phenomenon that they study.

Another reason for the perpetuation of such a disparaging attitude towards the topic is because a genuine study of nutrition involves a different approach from that employed by 'modern medicine'; as indicated by Dr T Colin Campbell PhD who, in his 2017 article entitled *Nutritional Renaissance and Public Health Policy*, states that,

“Nutrition is a wholistic science whereas medical practice is reductionist, a serious mismatch that causes biased judgement of nutrition.”

This reductionist approach is widespread throughout modern medicine; this can be seen by the fact that there are many different specialist fields that each focus on a separate part of the body or on a single disease. It is therefore unsurprising that the medical establishment studies individual nutrients on the basis of the idea that they each function independently; but this too is a serious error.

The development of microscopes with increased lens magnification that enabled scientists to discover the fundamental components of 'matter', also facilitated the study of foods, which were discovered to be comprised of the substances known as nutrients, of which there are two main categories. Nutrients that are required by the body in relatively large amounts are referred to as macronutrients, of which there are three types; namely, carbohydrates, fats and proteins. Nutrients that are required in comparatively small amounts are called micronutrients, of which there are two types; namely, vitamins and minerals.

Carbohydrates, a group that comprises starches, sugars and fibre, are found in a wide variety of foods. They are referred to as the body's main source of energy, because most carbohydrates are broken down during the digestive processes and converted into sugars, the main type of which is glucose, also known as blood sugar, that is used or stored according to the body's energy needs.

Although sugars are a form of carbohydrate, they are not all the same nor are they all processed by the body in the same way, as discussed in chapter six. However, it is important to emphasise that the processes that convert carbohydrates into glucose and release glucose into the bloodstream are tightly controlled by the body's self-regulating mechanisms; but these mechanisms can be disrupted by the consumption of certain carbohydrates, especially refined carbohydrates and sugars.

Sucrose, or refined sugar, is a manufactured substance that is a common ingredient of processed food products and has been associated with many conditions of ill-health, including diabetes. The consumption of sucrose disrupts the body's normal control mechanisms and causes a surge in the level of sugar released into the bloodstream. It is widely acknowledged that this 'sugar surge' increases the generation of free radicals that can lead to oxidative stress and free radical damage, the underlying mechanism common to most, if not all, chronic health problems, including diabetes.

The problems with refined sugars were discussed in chapter six, but it is important to reiterate that the recommendation to reduce the intake of 'free sugars' does not apply to the natural fructose found in fresh foods, especially fruits and vegetables.

Starches are found in some vegetables but mostly in grains; they are the carbohydrates common to most staple foods, such as bread, pasta, rice, corn and potatoes. They are also the main form of carbohydrates that are converted into glucose and therefore constitute a major source of calorie intake. It is for this reason that starch-based foods are usually minimised, or even avoided, by people who wish to lose weight by reducing their calorie intake.

This is yet another example of the misplaced focus on the calorific value of foods rather than their nutritional value. A far more important quality of starch-based foods that should be considered is whether they have been refined or not. In common with all forms of processing, the 'refining' of grains substantially reduces their nutritional content to the extent that most have little, if any, remaining nutritional content. Rice, for example, is refined by the removal of the husk, bran and germ, but these are the parts that contain virtually all

of the nutrients; refined rice is therefore almost entirely devoid of any nutritional value.

Many refined grains, such as wheat, and the products with which they are made, such as breads, are then ‘fortified’ to replace the nutrients lost in processing; but, for reasons discussed later in this section, the nutritional content is not improved through fortification with individual nutrients. Most refining processes also deplete grains of their fibre, which is another extremely important component as it provides the roughage necessary for proper digestion. There is, however, an increasing acknowledgement that whole grains are healthier than refined grains; even the WHO *Healthy diet* fact sheet refers to the inclusion of whole grains as part of a healthy diet.

Proteins, the second category of macronutrients, are comprised of amino acids, some of which are synthesised by the body, although others, referred to as essential amino acids, are not and must therefore be obtained from the diet. Animal-based foods, such as meat and dairy products, are rich sources of protein and believed to be the body’s main, if not only, source of protein. On the basis of the erroneous belief that humans are ‘natural’ meat-eaters, a topic that will be discussed later in this section, it is claimed that diets that exclude animal foods will be protein deficient. This is, however, an erroneous claim; as indicated by a 2013 article entitled *Nutritional Update for Physicians: Plant-Based Diets*, which states that,

“Generally, patients on a plant-based diet are not at risk for protein deficiency.”

Although the article defines a ‘plant-based diet’ as one that minimises rather than avoids the consumption of animal foods, it nevertheless, recommends that physicians encourage their patients to increase their consumption of plant foods.

It is important to note that a fully plant-based diet, in other words, one that totally excludes animal foods, is perfectly capable of fulfilling the human requirement for protein. Furthermore, in his book entitled *The China Study*, T Colin Campbell refers to a significant volume of compelling research which shows that,

“...plant protein, which allows for slow but steady synthesis of new proteins, is the healthiest type of protein.”

Fats, the third category of macronutrients, are important components of the diet, even though they are notoriously high in calories. However, like the other macronutrients, fats have also been the subject of misleading information, the most significant of which relates to the association between the intake of fats, raised cholesterol levels and increased 'risks' to health. Although the mistaken ideas about 'good' and 'bad' cholesterol were discussed in chapter one, it must be reiterated that cholesterol is essential for many of the body's functions, and that most of the body's cholesterol is produced by the liver. It is also important to repeat that the health problems claimed to be associated with high cholesterol levels are not caused by 'bad' cholesterol, but by oxidised cholesterol. In his 2006 book, *Health and Nutrition Secrets*, Dr Russell Blaylock states that,

“More than fifteen years ago it was discovered that cholesterol is not dangerous unless it is oxidised...”

The reason that LDL cholesterol has been designated as the 'bad' form is because it is easier to oxidise than HDL cholesterol. As discussed in chapter seven, Dr Blaylock explains that cholesterol is oxidised by free radicals and that,

“...oxidized HDL cholesterol is just as dangerous as oxidised LDL cholesterol.”

The most unhealthy types of fat are hydrogenated fats and industrially-produced trans-fats; as indicated by the WHO *Healthy diet* fact sheet which states that these fats,

“...are not part of a healthy diet and should be avoided.”

It should be noted that these fats are only found in industrially-produced processed food products; they are therefore easy to avoid.

The fact sheet also recommends that the intake of saturated fats, which are almost exclusively found in animal foods, is reduced. The suggested ways to achieve this reduction include the replacement of full-fat dairy foods with reduced-fat versions; but these are not necessarily healthier options because the removal of the fat content requires additional processing, which further reduces the overall nutritional content.

Another suggested method by which the intake of saturated fats can be reduced is the replacement of fats such as butter, lard and

ghee, with polyunsaturated fats, such as soybean, canola, safflower and sunflower oils, on the basis that they are healthier; but this too is not necessarily the case. Some of these oils are produced from GM crops; this is particularly the case with respect to oils made from soybeans, which are one of the most common GM crops. Furthermore, these oils, which are often described as 'refined', are usually produced by industrial processes that subject the crops to harmful chemicals in the extraction of the oil.

Oils can be produced by methods that do not involve GM crops or harmful chemicals and are therefore healthier; cold pressing, for example, is the method commonly used to produce oils such as olive and coconut oils. Although there are recommendations that even these oils should be avoided because of their fat content, this advice is based on the erroneous idea that all forms of 'fat' raise cholesterol to a dangerous level.

It is clear from the foregoing that plant foods are excellent sources of all three macronutrients; but they are also vital sources of micronutrients, which the WHO web page entitled *Micronutrients* refers to as,

“...the ‘magic wands’ that enable the body to produce enzymes, hormones and other substances essential for proper growth and development.”

One of the essential roles of micronutrients, with particular reference to the underlying mechanism of all forms of 'disease', is to act as antioxidants and therefore protect the body from oxidative stress and the resulting free radical damage; as Dr Russell Blaylock explains in *Health and Nutrition Secrets*,

“... most of us are familiar with vitamin antioxidants such as vitamin A, beta-carotene, vitamin C, and vitamin E. All are powerful antioxidants that neutralize a significant number of free-radicals. Less well-known antioxidants are vitamins D and K, magnesium, zinc and manganese. Also, there are over forty carotenoids and five thousand flavonoids from plants in the human diet that act as antioxidants.”

He explains that all of these antioxidants are important for the body because,

“Each antioxidant acts in a different place in the cells and tissues.”

Although the identification of different micronutrients has facilitated a certain level of understanding of nutrition, the study of individual nutrients and their functions is a perfect example of the reductionist approach that prevails within the medical establishment and, to a certain extent, the ‘alternative health’ community, many of whom also promote the health benefits of individual nutrients. The main consequence of this approach has been to ignore the wholeness of foods and to only consider their individual fragmented components. This is, however, a serious mistake; in the case of food, the whole is definitely far greater than the sum of its parts.

Nevertheless, the study of the individual nutrient components of foods has led to ideas that a deficiency in a single nutrient can lead to specific health problems; the WHO, for example, claims on the web page entitled *Micronutrient deficiencies* that,

“Vitamin A deficiency (VAD) is the leading cause of preventable blindness in children...”

Other ‘diseases’ have also been associated with specific nutrient deficiencies; scurvy, for example, is claimed to be caused by a severe vitamin C deficiency. However, the ‘new’ explanation of disease demonstrates that scurvy can be more accurately described as a condition that results from oxidative stress and free radical damage due to a severe antioxidant deficiency. This can be seen by the fact that scurvy can be resolved by the addition of citrus fruits such as limes or lemons to the diet. As discussed below, foods contain complex mixtures of nutrients; which means that deficiency diseases can never be due to a deficiency of only one single type of nutrient.

It is increasingly recognised that the ‘modern diet’, meaning one comprised mainly, if not entirely of manufactured processed food products and drinks, is unable to supply all of the micronutrients essential for health. However, it is believed that this problem can be solved through the use of dietary supplements that supply ‘missing’ nutrients. But this is an erroneous belief for many reasons, one of which is that it is virtually impossible to test for individual nutritional deficiencies. But even if a deficiency of a particular nutrient could be

ascertained, the problem cannot be solved by chemical compounds synthesised in a laboratory. Although the dietary supplements industry justifies the use of synthetic chemicals on the basis that they are 'chemically identical' to the nutrients that occur naturally in foods, this is grossly misleading. The problem with vitamin supplements is explained by Dr Robert Thiel PhD in his article entitled *The Truth About Vitamins in Supplements*, in which he states that,

“The truth is that most vitamins in supplements are made or processed with petroleum derivatives or hydrogenated sugars.”

In his article entitled *Food Antioxidants are Superior to Isolated Antioxidants*, he further explains that, even if they were chemically similar, the vitamins in manufactured supplements are structurally different from those found in foods. An even more important fact is that the vitamins in foods are always accompanied by 'other elements' that are necessary for the absorption of the nutrients into the body's cells, but are entirely absent from supplements. The vitamins in supplements are therefore incomplete nutrients, as Dr Thiel explains,

“Isolated, non-food vitamins, even when not chemically different are only fractionated nutrients.”

Although certain vitamin supplements are claimed to be 'food-based', these too lack all of the 'other elements' that occur naturally in foods and are essential for the proper functioning of nutrients. The importance of these 'other elements' cannot be overstated; their absence is a major obstacle that prevents supplements from being able to confer any significant health benefits. It is for this reason that research studies, which investigate the effects of individual nutrients by conducting experiments with synthetic chemical compounds, invariably report few, if any beneficial health effects.

These problems are not exclusive to vitamin supplements; they also apply to mineral supplements, as Dr Thiel explains in his article entitled *The Truth About Minerals in Nutritional Supplements*,

“The truth about nearly all minerals in supplements is that they are really industrial chemicals made from processing rocks with one or more acids.”

The human body is unable to digest rock minerals, which are rejected as unusable and expelled from the body; supplements of

this nature are therefore entirely useless. Plants, by comparison, are perfectly able to absorb natural rock minerals and convert them into a form that is suitable for digestion, absorption and assimilation by the human body when plants are consumed. It is for this reason that plants are the only sources of minerals that the human body can absorb, as Herbert Shelton states,

“We have to draw our mineral nutrients exclusively from the plant kingdom and not from the soil.”

In order to function effectively, minerals also require the presence of ‘other elements’, including other minerals that must be in the right form and in the right balance with respect to each other. The importance of this relative balance can be demonstrated by reference to the relationship between calcium and magnesium. Calcium is known to be essential for healthy bones, but its effectiveness also requires the presence of vitamin D, as indicated by the NHS web page entitled *Food for strong bones* that states,

“You need sufficient calcium to strengthen your bones and vitamin D to help your body absorb calcium.”

On the basis of this need for adequate calcium, people are advised to ensure their diet includes a good supply of calcium-rich foods, especially milk and dairy products. But a high intake of calcium alone is unable to strengthen bones, even in the presence of adequate levels of vitamin D. The reason is that the absorption of calcium into the bone also requires adequate levels of magnesium, which the NHS web page clearly fails to mention. Nevertheless, Dr Carolyn Dean explains in *The Magnesium Miracle* that,

“Adequate levels of magnesium are essential for the absorption and metabolism of calcium.”

Most diets provide a sufficient intake of calcium, but rarely provide sufficient magnesium. The inevitable result of the regular consumption of a magnesium-deficient diet will be an imbalance between the relative levels of calcium and magnesium; an imbalance that can have many potentially harmful consequences for health. A high level of calcium that is not readily absorbed into bone due to insufficient magnesium can result in a build-up of calcium in the blood, which can cause kidney stones. If the level of calcium becomes very high, it can lead to a condition known as

hypercalcemia, which, although rare, can impair the normal functions of the brain and heart.

Magnesium is therefore an extremely important mineral, but its functions are not limited to assisting the absorption of calcium into bone; it is also associated with many other functions, as Dr Dean states,

“Magnesium regulates more than 325 enzymes in the body...”

One of the main reasons that most diets are magnesium deficient is because this essential mineral is depleted by all forms of processing; processed food products will therefore be particularly low in magnesium. This deficiency can, however, be rectified by the consumption of magnesium-rich foods, as Dr Dean advises,

“To enrich your diet with magnesium, increase your consumption of green vegetables, nuts, seeds, legumes and unprocessed grains.”

A similar relationship exists between sodium and potassium, both of which are important for the healthy functioning of cells, especially those of the heart. The WHO *Healthy diet* fact sheet recommends that the intake of salt is reduced in order to lower the body's sodium levels. But this is misleading; the body cannot metabolise rock minerals and therefore does not absorb sodium from 'table salt'. As discussed in chapter one, one of the main causes of elevated sodium levels is a deficiency of potassium. The medical establishment has, however, begun to recognise the importance of potassium in balancing the level of sodium; as indicated by the October 2018 WHO *Healthy diet* fact sheet which states that,

“Potassium can mitigate the negative effects of elevated sodium consumption on blood pressure. Intake of potassium can be increased by consuming fresh fruit and vegetables.”

It is clear that an increased intake of fresh fruits, vegetables and other plant foods will mitigate many health problems.

Soil nutrient levels have unfortunately declined substantially over the past few decades in many parts of the world and this has inevitably reduced the nutritional content of the foods grown in such nutrient-poor soils; but this problem cannot be solved through the use of nutritional supplements or the fortification of foods. The only

solution is to replenish the soil with nutrients. It is claimed that fertilisers perform the important task of replacing lost nutrients; but the products used by most industrial agricultural practices are NPK fertilisers, which means they only contain nitrogen, potassium and phosphorus, and are therefore deficient in all of the other important minerals, especially magnesium. However, the fact that they lack many essential nutrients is not the only problem associated with these fertiliser products; the discussion in chapter six referred to the sources of the phosphorus and nitrogen used by the fertiliser industry.

In addition to the major minerals, are others that are required in such tiny amounts that they are referred to as ‘trace elements’. In 1996, the WHO produced a report entitled *Trace elements in human nutrition and health*, which, according to a web page with the same title, provides authoritative recommendations about nineteen trace elements divided into three categories. The page states that,

“These include essential elements, such as iodine and zinc, probably essential elements, such as manganese and silicon, and potentially toxic elements, such as fluoride, lead, cadmium and mercury, which may also have some essential functions at low levels.”

This report appears to be the most recent WHO publication on the topic of ‘trace elements’ but it is in urgent need of revision. An abundance of evidence has accumulated since 1996 that demonstrates unequivocally that fluoride, lead, cadmium and mercury are all definite rather than merely ‘potential’ toxins; there is also ample evidence that demonstrates none of them has any ‘essential function’ in the human body at any level.

It should be clear that a reductionist approach to nutrition is entirely wrong because the focus on individual nutrients ignores the importance of the wholeness of foods; as indicated by Herbert Shelton who states in his book entitled *The Science and Fine Art of Natural Hygiene* that,

“All of this modern attention to separate food factors—proteins, carbohydrates, fats, minerals, vitamins, etc.—amounts to fragmentation of what should be something whole and sound, accessible to us without our having to take thought.”

The nutrients contained in different foods, although in varying amounts and combinations, are always accompanied by all of the necessary 'other elements' that enable them to perform their function, which is to support the body's processes that maintain health as well as sustain life, as Dr Blaylock explains,

"There is growing evidence that it is the combined effects of these complex nutrients – not single nutrients – that provide us with such memorable health benefits."

The reason that foods provide such health benefits is because the nutrients they contain function synergistically, as indicated by Dr Campbell who, in his previously cited *Nutritional Renaissance* article, states that,

"The wholeness of food illustrates how nutrients working collectively and dynamically, create health."

Another misleading idea, which is based on the exhortation by Hippocrates to 'let thy food be thy medicine', is that certain foods have 'medicinal properties'. Some foods, for example, are claimed to be 'natural antibiotics'; but this is an erroneous claim. The human body is the natural home of trillions of bacteria, most of which reside in the digestive system where they assist the digestive processes. This not only means that real foods do not kill bacteria, but that substances that do kill bacteria cannot be referred to as 'foods'. Although some are claimed to be particularly beneficial for health, foods do not act as 'medicine'; as Herbert Shelton states,

"...in no sense can foods be regarded as medicinal. Foods are nutritive substances..."

Foods therefore, do not kill germs, 'heal' the body or 'cure' any disease. Healing is a biological process that is solely performed by the body, whose innate self-healing mechanisms are supported by the nutrients obtained from foods.

One of the consequences of the reductionist approach to nutrition, together with the belief that 'everything is made from chemicals', has been that the food industry has been permitted to use synthetic chemicals as ingredients of their products, and as food additives to perform certain 'technological functions'. However, despite the claim that they are 'chemically identical' to the elements found in a food, no industrially-produced compound can reproduce a product of

nature in exactly the same form as that provided by nature; as Herbert Shelton explains,

“It is possible to analyze an apple and ascertain its chemical constituents; but all the chemists in the world cannot make an apple, nor anything that can substitute for it.”

Nevertheless, the WHO approves the use of chemical substances in food products on the proviso that they meet the standards set by the Codex Alimentarius Commission. Although previously cited in chapter six, the definition of a ‘food additive’, according to Codex standard STAN 192-1995, deserves repetition; it states,

“Food additive means any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value...”

A substance that is not normally consumed as a food or has no nutritive value cannot be described as a ‘food’. As stated earlier in this discussion, a substance that is not a nutrient will be antagonistic to the body and should, more accurately, be described as a ‘poison’. Nevertheless, the WHO, which claims to be the authority for public health, permits the use of ‘poisons’ on the basis that they are deemed ‘safe’ according to JECFA. However, as discussed in chapter six, ‘safe’ is a relative term that means the substance is regarded as safe provided it does not exceed the recommended usage level.

Real foods are inherently safe; their safety can only be compromised if they have been contaminated by toxic substances. However, even if uncontaminated, real foods may cause digestive discomfort, but this will only occur if an excessive amount has been consumed, as Herbert Shelton explains,

“The overconsumption of the best foods will produce trouble.”

This ‘trouble’ may include pain and discomfort, which are the body’s signals to cease eating so that the over-extended digestive system can process the food already consumed. It is inappropriate to interpret these symptoms to mean that the food has become a ‘poison’ due to the consumption of a large dose.

Food additives, by comparison, are inherently toxic due to the nature of their ingredients, but the consumption of foods that contain

additives may not immediately produce an effect, because the additive may be at a sufficiently low level that the body is able to process and expel it. However, the ability to tolerate toxins will differ according to each individual and their state of health.

The body's reactions to the consumption of foods containing toxic substances may be dramatic and involve symptoms such as vomiting and diarrhoea, or they may involve symptoms that are commonly associated with 'allergies'; the problems with the attribution of symptoms to a 'food allergy' were discussed in chapter seven. However, it is not insignificant that there is an increased incidence of allergies that correlates with the increased use of toxic chemicals in agriculture and food production. It may be argued that this correlation is not proof of causation, but this is an inappropriate argument, because there is an abundance of evidence that undeniably shows direct links between allergies, exposures to toxic substances, oxidative stress and illness. The problems with toxins are discussed in more detail later in the chapter.

In addition to the acknowledgement by the WHO on the *Nutrition* web page that 'good nutrition' is an important component of 'good health', is the acknowledgement that 'poor nutrition' is related to 'poor health'; as indicated by the statement that,

“Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity.”

Although 'poor nutrition' is often equated to 'underfed', these terms are not synonymous; as previously discussed, people who are well-fed can also suffer from 'poor nutrition', or 'malnutrition' as it is also called. This is particularly the case when the diet is one that is almost entirely comprised of processed food products and drinks that are low in nutrients, even though they may be high in calories. The WHO recognises that 'malnutrition' can be caused by nutrient deficiencies; as indicated by the previously cited WHO *Malnutrition* fact sheet that states,

“Malnutrition refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients.”

This statement is however, misleading with reference to excesses in the intake of nutrients; as the discussions about carbohydrates,

proteins and fats have demonstrated, it is not the quantity but the quality of these macronutrients that is most important to health. Furthermore, the claim that malnutrition can occur due to an insufficient intake of 'energy', meaning calories, is erroneous; 'calories' are not nutrients.

People who consume large quantities of processed foods that are high in calories but low in nutrients may, however, continue to feel hungry, but this is not because the body craves 'more food'; instead, the feeling of 'hunger' is more likely to indicate a craving for nutrients; as Dr Carolyn Dean explains,

"Food craving and overeating can be simply a desire to continue eating past fullness because the body is, in fact, craving nutrients that are missing from processed food."

According to the *Malnutrition* fact sheet, one of the forms of malnutrition is 'undernutrition', which is claimed to have four sub-forms, namely, wasting, stunting, underweight and deficiencies in vitamins and minerals. But 'undernutrition' by definition refers to an inadequate intake of nutrients; which means that wasting, stunting and underweight are the result of 'undernutrition', not different sub-forms of it.

Another 'form' of malnutrition is referred to as 'protein-energy malnutrition', which is described in a WHO document entitled *Global burden of protein-energy malnutrition in the year 2000* that states,

"Protein-energy malnutrition is a nutritional deficiency resulting from either inadequate energy (caloric) or protein intake and manifesting in either marasmus or kwashiorkor."

Protein is especially important for growth and development and is therefore essential for the diets of young children. However, 'malnutrition' cannot be attributed to a single nutrient deficiency; as discussed earlier in this section, foods provide a wide variety of different nutrients, both micronutrients as well as macronutrients, all of which are essential, not only for growth and development but for other functions. Unfortunately, the interventions provided by the WHO and other aid agencies in order to help solve the interrelated problems of hunger and undernutrition, involve the distribution of certain pre-packaged 'food products'. As discussed in chapter eight, one of these products is called RUTF (ready-to-use therapeutic food). The UNICEF web page entitled *Ready-to-Use Therapeutic Food for Children With Severe Acute Malnutrition* describes RUTF as energy-dense pastes that have been enriched with micronutrients and states that,

"Typical primary ingredients for RUTF include peanuts, oil, sugar, milk powder, and vitamin and mineral supplements."

Although products like RUTF may provide temporary relief from acute starvation, they do not provide the solution to 'undernutrition'. The description of these products as 'energy-dense' means that they are high in calories, but that does not mean that they are nutrient-dense. The typical primary ingredients of RUTF, as listed above, do not contain the wide range of essential micronutrients, especially antioxidants, that are necessary to protect the body from free radical damage. The increased susceptibility to disease that is recognised to be associated with malnutrition, can only be addressed by providing people suffering from malnutrition with real foods that are rich in all of the nutrients, not just those that provide energy. Furthermore, the addition of supplements to these products will not resolve the nutritional deficiencies of their primary ingredients.

Nutritional supplements are frequently taken in the absence of any test to determine the nature of the deficiency or even if any deficiency actually exists; it should be noted that no test can determine the body's nutritional status, as many nutrients are retained in organs and tissues that cannot be tested. One of the main reasons that people take supplements is to boost their intake of vitamins and minerals on the basis of the health benefits they are

claimed to confer. Yet rarely do people realise that their nutritional intake would receive a far greater boost if they improved their diet; the main reason that many people are reluctant to make fundamental changes to their diet is suggested by Dr Campbell, who, in his previously cited 2017 article, states that,

“A major reason why isolated nutrients, as supplements, are still used by the public is the false assumption (or excuse?) that we can retain the desired health while continuing to eat our favorite foods, however unhealthy they may be.”

It should be clear from this discussion that the only real source of the nutrients required by the body is food, especially fresh, whole, plant-based foods that have not been subjected to toxic chemicals, such as pesticides, or unnatural processes, such as genetic modification. These are the types of foods that comprise a healthy diet. However, although referred to as a ‘diet’, the regular consumption of nutrient-rich foods should not be regarded as a temporary measure to attain a particular goal, but as a new and healthy way of living, as Dr Henry Bieler explains in *Food is Your Best Medicine*,

“For proper food is not just for the health faddist but is, when you are aware of the facts, truly a way of life.”

The ubiquitous use of synthetic chemicals means that it is almost impossible to ensure that foods are entirely chemical-free, but it is possible to minimise exposures by choosing to consume produce that has been grown organically. Exposures to toxic substances can also be reduced by avoiding processed food products and drinks that almost inevitably contain chemical additives. The increased demand for healthy foods has led some manufacturers to produce foods that contain fewer unhealthy ingredients; it is therefore important to read product labels to make healthy choices.

The healthiest diet is, however, one that is comprised of fresh, whole, unprocessed, organic plant-based foods, as Dr Blaylock suggests,

“In truth, the only way to protect yourself and your family is to eat only fresh foods that have no additives.”

As briefly mentioned earlier in this section, it is widely believed and commonly argued that humans are natural omnivores; the main

justification for this argument is the existence of prehistoric hunter-gatherer societies in many parts of the world. This argument can, however, be refuted by three counter-arguments.

Firstly, the fact that prehistoric peoples ate meat only proves the existence of a behaviour that has become a habit, it does not prove that the behaviour is natural. Secondly, many societies around the world have an equally long-established habit of abstaining from eating animal foods, in addition to which are the many millions of people today who continue to not only survive, but thrive on a meat-free diet; which demonstrates unequivocally that meat is not an essential component of the human diet. The third, and most compelling, refutation of the idea that humans are natural meat-eaters argues from the perspective of human anatomy and physiology, rather than human behaviours and habits.

A comparison of certain aspects of human anatomy and physiology with those of carnivores, omnivores and herbivores demonstrates a number of differences, the most significant of which occur within the digestive system. Whilst similarities exist between the digestive systems of carnivores and omnivores, they are both significantly different from the human digestive system. The only reason for these differences must be related to the foods the digestive system is capable of processing.

It is clear that, despite the passage of many hundreds of thousands of years, humans have not 'evolved' to become natural meat-eaters, because the human digestive system has not adapted to become more like that of carnivores and omnivores that can easily process meat.

Although it is sometimes suggested that humans are more akin to herbivores, this too is incorrect, as the human digestive system cannot process the cellulose found in many of the plants, especially grasses, that are consumed by herbivores. The diet most suited to humans, because it is most suited to human anatomy and physiology, is a frugivorous one; as indicated by Herbert Shelton, who states in his book entitled *The Hygienic System: Vol II Orthotrophy* that,

“The number and structure of his teeth, the length and structure of his digestive tract, the position of his eyes, the

character of his nails, the functions of his skin, the character of his saliva, the relative size of his liver, the number and position of the milk glands, the position and structure of the sexual organs, the character of the human placenta and many other factors all bear witness to the fact that man is constitutionally a frugivore.”

The term ‘frugivore’ aptly describes a diet comprised of fruits, vegetables, nuts and seeds; however, it also includes other parts of plants, as he further explains,

“As there are no pure frugivores, all frugivores eating freely of green leaves and other parts of plants, man may, also, without violating his constitutional nature, partake of green plants. These parts of plants possess certain advantages, as has been previously pointed out, in which fruits are deficient. Actual tests have shown that the addition of green vegetables to the fruit and nut diet improves the diet.”

The term frugivore has not however, been widely adopted, except by people who follow the practices of Natural Hygiene. People who eat neither meat nor fish but do eat dairy foods are vegetarians, whereas people who abstain entirely from animal and dairy foods are vegans. However, vegetarian and vegan diets are not necessarily ‘healthy’ because they do not automatically preclude the consumption of processed food products. The term ‘whole food plant-based’ may also be used to describe this type of diet. Whatever label may be chosen to best describe it, the healthiest type of diet is one that includes a wide variety of fresh, whole, unprocessed, plant-based foods that have not been genetically modified or exposed to toxic chemicals.

Also important is that foods should be minimally processed, if at all, because all forms of processing, including cooking, reduce their nutritional content; this means that, where possible, foods should be consumed raw, as Herbert Shelton indicates,

“It is almost axiomatic that fruits, nuts and vegetables are the only foods that can be relished raw.”

It is also axiomatic that a diet that contains a variety of these foods will be one that provides the human body with the nutrition required to ensure optimal functioning, and thereby ensure good health. But

the attainment of good health also requires attention to be paid to the fluids consumed.

Water is an essential component of the body's cells; its presence in the body in adequate amounts is therefore vital, not only for health but for survival.

The body loses fluids throughout the day due to normal bodily functions such as respiration and excretion. If lost fluids are not replaced, the body's cells and tissues will soon become dehydrated, which, if prolonged, will lead to impaired functioning of many vital organs, especially the kidneys, and can eventually lead to death.

In his book entitled *Your Body's Many Cries for Water*, Dr F Batmanghelidj MD refers to chronic cellular dehydration and claims that it is the main cause of most chronic health conditions. However, although dehydration may be a contributory factor, it cannot be regarded as the main cause of chronic conditions, which are always the result of a combination of some, if not all, of the 'four factors' discussed in this chapter. Significantly, from the perspective of the 'new' explanation of disease, dehydration causes the body to become 'stressed', which increases the generation of free radicals that can induce oxidative stress and lead to free radical damage, the underlying mechanism common to virtually all conditions of ill-health, especially chronic conditions.

It is generally asserted that the human body requires a daily intake of approximately 6 to 8 glasses of fluids; there are, however, differing opinions about which beverages can be included in those fluids. Dr Batmanghelidj, for example, advises that the daily intake should be comprised solely of water in order to ensure that the body is fully hydrated.

By contrast, the British Nutrition Foundation (BNF) states that consuming water is a 'good choice', but that it is not necessary to only consume water because,

"Other drinks such as squash, fruit juice, fizzy drinks, tea and coffee contribute to our daily requirements too."

This statement is highly misleading, but illustrative of the poor level of knowledge about nutrition promulgated by organisations that claim to be in a position to educate the public on the subject. On the BNF web page entitled *Healthy hydration guide*, it is acknowledged that

fizzy drinks and squashes contain sugar and that their consumption should be minimised, but it is nevertheless claimed that these sugary drinks can be replaced by 'diet' versions; the problems with the artificial sweeteners used to replace sugar in foods and drinks have been discussed. Furthermore, although tea and coffee contain water, they both have a diuretic effect, which increases the volume of fluids lost to excretion and therefore increases the body's fluid intake requirement.

It would therefore seem preferable that water is the main, if not the only, liquid consumed each day, as Dr Batmanghelidj advises; unfortunately, virtually all of the water made available for drinking is not as 'clean' as it ought to be.

According to the claims of the medical establishment, the main problem that affects the cleanliness of drinking water is the presence of 'germs' that are said to cause a number of diseases that can be transmitted through contaminated water; as indicated by the February 2018 WHO fact sheet entitled *Drinking-water* that states,

"Contaminated water can transmit diseases such as diarrhoea, cholera, dysentery, typhoid, and polio."

Although the WHO recognises faecal matter to be the main contaminant, it is claimed that these 'diseases' are caused by 'germs' that infect people via the faecal-oral route, and that it is the 'germs' that cause the symptoms associated with these diseases; it should be emphasised that diarrhoea is a symptom not a disease. These claims are however, disingenuous. Symptoms such as vomiting and diarrhoea are not caused by any 'germ'; instead, they are the body's reactions to toxic substances, such as faecally-contaminated water, and represent its efforts to expel those toxins. The WHO claims that diarrhoeal diseases, which are said to be mainly prevalent in 'developing' countries, are largely the result of the inadequate management of water; as indicated by the statement in the fact sheet that was cited in chapter six, but deserves repetition,

"Inadequate management of urban, industrial and agricultural wastewater means the drinking-water of hundreds of millions of people is dangerously contaminated or chemically polluted."

Yet water management systems that are claimed to be 'adequate' also supply hundreds of millions of people with water that is contaminated and chemically polluted; some of the chemical pollutants are the substances used to 'treat' water to make it 'safe', but again, safe is only a relative term. As discussed in chapters six and eight, most of the water made available for human consumption, especially through municipal water supplies, cannot be referred to as either safe or clean.

The chemicals used to 'purify' water are claimed to be present in concentrations that are within the levels deemed to be safe; but these chemicals are inherently toxic as their purpose is to kill bacteria, which are living organisms. The Paracelsus fallacy that claims a substance is only a poison when it reaches a certain 'dose' therefore permits water to be poisoned. In addition to the toxic substances used to 'purify' water, are the many chemical contaminants, especially those produced by industrial and agricultural activities and discharged as effluent, that remain in water, because water treatment systems are unable to remove them.

It is clear that the quality of water supplied as 'drinking water' is extremely poor, as discussed in chapter six, despite claims that it is 'safe'. There are however, solutions to the problem of the poor quality of drinking water that can be applied in the home or workplace. These solutions involve the use of filters or filtering systems that are able to remove some or even most of the contaminants in water. This inevitably raises the question of why these filters are not applied before the water is delivered to the public.

One type of water filtering systems involves the use of reverse osmosis, which is claimed to remove virtually all contaminants, including fluoride and pharmaceuticals, but also removes minerals from the water, which has led to some controversy about whether these systems can be considered beneficial or not.

Water is represented by the chemical symbol H_2O . Although this 'pure' form of water may be consumed for a short period of time to assist with detoxification, it is considered by many to be unsuitable for consumption for extended periods of time or on a regular basis; however, in *Orthotrophy* Herbert Shelton states that,

“Fresh rain water and distilled water are best. Distilled water is not dead, as some foolishly say it is. Pure water from a rock spring is excellent drink.”

The increasing level of air pollution means that rain water is no longer a good source of truly clean fresh water. The reason that ‘pure’ or distilled water is claimed to be unsuitable for drinking is because it is devoid of minerals; however, Herbert Shelton refutes this claim in *Orthotrophy* in which he states that,

“It is said that the body needs the minerals dissolved in the water. That the body needs minerals is certain, but it needs them, as previously shown, in the form of organic salts and derives these from foods.”

Although most information about fluid intake refers solely to liquids, some recognise that many foods, especially fruits and vegetables, contain a significant volume of water that contributes to the daily intake of fluids, as Herbert Shelton also states in *Orthotrophy*,

“Most green vegetables and fresh fruits contain a higher percentage of water than the adult body. If the diet contains an abundance of these foods little or no additional water will be required.”

He adds that,

“Dr Alcott and others of the vegetarian school proved by direct experiments that those who adopt an exclusively vegetable regimen and make a large proportion of their diet consist of juicy fruits and succulent vegetables can be healthfully sustained and nourished without water-drinking.”

A frugivorous diet therefore not only provides the body with water, but the water it provides is of a far superior quality to ‘treated’ water; as Dr Henry Bieler states in *Food is Your Best Medicine*,

“The quality of water found in melons, papayas, raw carrots, cucumbers and celery is distinctly more beneficial to the body than the chlorinated, chemically processed and irritating fluid that too often comes from the faucet.”

However, unless people consume a wholly frugivorous diet, it will be necessary to consume some additional fluids; but these fluids can be provided by healthy drinks, especially freshly-prepared, home-

made fruit and vegetable juices. There are many different machines available that are able to extract juice from a wide variety of fruits and vegetables; it should be obvious from the discussion in the previous section that, where possible, the fruits and vegetables to be juiced should be organically grown to ensure that they have been minimally exposed to toxic chemicals and have not been genetically modified.

It should be clear that freshly-prepared juices from clean, organically-grown fruits and vegetables are far healthier than manufactured juices and juice drinks, especially those that have been made from concentrates and contain high levels of sugars or artificial sweeteners. It should be noted that packaged juices and juice drinks will invariably have been pasteurised, a process that further reduces their nutritional content. Freshly-prepared home-made juices will not only boost the body's intake of fluids, they will also increase the intake of nutrients; fresh juices should, however, be consumed in addition to whole fruits and vegetables; they are not to be considered as substitutes for these whole foods.

Toxic Exposures

The word 'toxin' is derived from the Greek word for poison, but its meaning has been altered so that it only refers to a specific type of poison; as indicated by the previously cited establishment definition that describes a toxin as,

“a poison produced by a living organism, especially by a bacterium.”

There are a number of living organisms that can produce poison, the purpose of which is either defensive, to protect themselves against predators, or offensive, to incapacitate or kill their prey. Bacterial toxins, by contrast, are claimed to have an entirely different purpose, which is to cause disease; as indicated by a January 2019 article entitled *Evolutionary Features in the Structure and Function of Bacterial Toxins*, which states that,

“Bacterial toxigenesis is a major mechanism by which pathogenic bacteria produce diseases.”

The article acknowledges that toxins are only produced by some bacteria, but exposes yet another 'knowledge gap' in the statement that,

“It is still a mystery, however, as to why certain bacteria produce such potent molecules while others do not.”

This mystery will not, however, be solved whilst the medical research community continues to adhere to the erroneous idea that any bacterium produces a ‘poison’ with the sole purpose of causing disease, especially within the human body.

The original Latin word for poison or poisonous substance is ‘virus’, the definition of which has been so completely altered that it now refers exclusively to an ‘infectious agent’. However, as previously discussed, the particles referred to as ‘viruses’ are pieces of genetic material in a protein coating that possess none of the properties required to justify their description as either ‘alive’ or ‘infectious’.

The theories that claim bacteria, viruses, or any other ‘germs’ to be responsible for causing disease have been shown to contain many knowledge gaps, as well as a number of anomalies and contradictions. Yet, although the medical establishment acknowledges the existence of these gaps, anomalies and contradictions, it fails to recognise that their combined effect is to pose a challenge to the veracity of those theories, and that this challenge is of such a serious and fundamental nature that it completely undermines the existence of the phenomenon referred to as an ‘infectious disease’.

One of the main reasons that the medical establishment continues to adhere to the ‘germ theory’ involves the influence of vested interests, especially those that control the industries that produce, use and discharge ‘toxic substances’. The attribution of blame for a large number of diseases to so-called ‘pathogenic microorganisms’ is clearly of immense benefit to these industries, as it deflects attention away from their hazardous activities and products. But, in reality, it is the continual exposure to these hazards that not only poses the real threat to human health, but also endangers the lives of all living organisms.

Although previously cited, it is useful to repeat that the establishment definition of a poison refers to,

“any substance that irritates, damages, or impairs activity of the body’s tissues.”

It is also useful to compare this to the establishment definition of a 'disease', which refers to,

“any bodily abnormality or failure to function properly...”

It is clear that these establishment definitions highlight a striking resemblance between the effects of a poison and 'disease'. Unfortunately, the significance of this similarity is invariably obfuscated by reference to the Paracelsus fallacy, which claims that everything is a poison in the appropriate dose; as indicated by the establishment definition of a 'poison' that also states,

“In large enough doses almost any substance acts as a poison, but the term is usually reserved for substances such as arsenic, cyanide and strychnine, that are harmful in relatively small amounts.”

The idea that the dose determines whether a substance acts as a poison or not is grossly mistaken; the dose of a substance cannot determine its fundamental nature, as Herbert Shelton indicates in his 1968 article entitled *What is a Poison?* in which he states that,

“Poisons are such qualitatively and not merely quantitatively.”

The dose of a poison does, however, determine the degree of harm it will cause. Although a low dose of a toxic substance may not appear to cause harm, this does not mean that no harm has occurred. One reason for an apparent absence of harm at a low dose is due to the body's ability to expel toxins and repair damage; but this does not mean that the substance can be considered 'safe' at that low dose. The degree of harm caused by a toxic substance also depends on the health status of the individual person exposed to that substance; a circumstance that is ignored by the medical establishment that operates according to the mechanistic view of the human body. But this view is fatally flawed, as it fails to acknowledge the existence of the body's innate self-protective and self-healing mechanisms; it also ignores the uniqueness of each individual person with respect to their health status and their existing body burden of toxins.

Furthermore, the idea that 'almost any substance' can act as a poison fails to differentiate between substances that are inherently toxic, and therefore harmful to all living organisms, and those that

are not inherently toxic, but may nevertheless adversely affect some organisms. The importance of this distinction cannot be overstated. It can, however, be illustrated by reference to a comparison between arsenic and citrus fruits.

Arsenic, a naturally-occurring substance, is inherently toxic and will therefore harm all living organisms, including cats, dogs, rabbits and humans. The degree of harm arsenic will cause to each type of organism, whether cat, dog, rabbit or human, will differ according to the exposure level and to the existence of innate abilities within each species to expel this particular toxin and repair the resulting damage. The degree of harm caused by arsenic will also depend on the unique health status and the unique body burden of toxins of each individual cat, dog, rabbit and human.

Citrus fruits are not inherently toxic; they are eminently suitable foods for humans, but are poorly tolerated by, and even considered 'toxic' to cats, dogs and rabbits. However, cats are carnivores, dogs are omnivores and rabbits are herbivores; they therefore have different dietary requirements from humans, who, as discussed in the previous section, are frugivores. The reason they all have different dietary requirements is due to anatomical and physiological differences, especially within the digestive system; it is these differences that determine which substances are recognised by the body as 'food' and which are recognised as 'non-food'. Nevertheless, the over-consumption of foods may produce unpleasant effects, but this discomfort should not be interpreted to suggest that the food has become a poison. The main purpose of such discomfort is to prevent any further intake of food as this would impede the digestive system's ability to process the food that has already been consumed.

Another reason that substances that are not inherently toxic, but may cause adverse effects, involves a disturbance to homeostasis, which is described in chapter 26 of the book entitled *Anatomy and Physiology*,

"Homeostasis, or the maintenance of constant conditions in the body, is a fundamental property of all living things."

Homeostasis requires that all of the substances necessary for the body to function properly are present in the 'right' amount;

substances that are present in the 'wrong' amount will disturb homeostasis and therefore disrupt the body's ability to function properly, as the book also states,

"In the human body, the substances that participate in chemical reactions must remain within narrow ranges of concentration. Too much or too little of a single substance can disrupt your bodily functions."

The disruption to bodily functions caused by the 'wrong' amount or concentration of essential substances, can be demonstrated by reference to the adverse health effects caused by a combination of excess calcium and insufficient magnesium, as discussed in the previous section. It should be obvious that calcium and magnesium do not become 'poisons' simply as the result of their presence in the body in the 'wrong' amounts; this is clearly the case with respect to insufficient magnesium; a substance cannot become a 'poison' by virtue of its presence at an inadequate level.

The plethora of substances that are inherently toxic include, not only the vast majority of the chemicals and compounds synthesised in the laboratories of the chemical industry, but also a number of naturally-occurring substances that have been exposed or brought to the surface from deep underground by the activities of various industries, as discussed in chapter six. Their inherently toxic nature means that these substances are incompatible with the human body's biochemical processes that sustain life; which means that they should not be ingested, inhaled, injected or otherwise absorbed into the body at any dose or exposure level.

Although different substances may cause different degrees of harm, they all cause damage at the cellular level, because the mechanism by which most, if not all toxic substances cause harm, is through the generation of free radicals that induce oxidative stress and lead to damage to the body's cells and consequently to tissues and organs. The growing body of evidence that recognises oxidative stress to be the underlying mechanism common to most chronic health problems further demonstrates that the relationship between 'toxic substances' and 'disease' is direct and causal.

The mechanism by which toxic substances produce their adverse effects was first recognised more than three decades ago; as

indicated by a 1986 article entitled *Free radicals and environmental toxins*, which states that,

“Some chemicals that contaminate our environment exert their toxic effects by virtue of their ability to form free radicals.”

Research studies in the 1990s discovered that the ability to form free radicals was not merely restricted to ‘some’ chemicals, but was found to be the mechanism common to increasing numbers of them; as indicated by a 1993 article entitled *Free radicals in toxicology*, which states that,

“Free radicals are recognized more and more frequently as being involved in the mechanism of toxicity of chemicals.”

The human body is not defenceless against the plethora of toxic substances to which it is regularly exposed; on the contrary, the body possesses a number of organs and systems that facilitate the removal of toxins from the body, otherwise known as detoxification. The most important organ that plays a vital role in detoxification is the liver, the establishment definition of which states that,

“It has an important role in the detoxification of poisonous substances...”

The definition also states that,

“The liver is the site of many important diseases...”

The ‘diseases’ referred to include hepatitis, cirrhosis and dysentery, all of which represent the efforts of the body to expel ‘poisonous substances’, as indicated by their common symptoms, especially vomiting and diarrhoea.

Although toxic substances can damage the liver, the body also possesses the ability to regenerate this important organ, as indicated by a 2007 article entitled *Liver Regeneration*, which states that,

“Liver manages to restore any lost mass and adjust its size to that of the organism, while at the same time providing full support for body homeostasis during the entire regenerative process.”

The ability to expel toxins and regenerate the liver are two of the reasons that the human body is able to withstand certain levels of exposures to toxic substances. The body’s self-protective and self-healing mechanisms can, however, be compromised, by a single dose of or exposure to an extremely toxic substance, such as

cyanide for example, that is potentially life-threatening. These mechanisms can also be compromised by continual exposures to toxic substances, which, although not life-threatening in a single dose or exposure, will nevertheless continue to cause damage at the cellular level and reduce the body's ability to function properly. These persistent exposures will also compromise the liver's ability to function properly and can even damage this vital organ.

Unfortunately, one class of 'toxic substances' that are known to cause damage to the liver are the pharmaceutical products used as 'medicines' to treat diseases, including diseases that affect the liver. The ability of commonly-used drugs to harm the liver is discussed in a 1986 article entitled *The Spectrum of Hepatotoxicity Due to Drugs*, which states that,

"Drugs in common use can cause toxic effects on the liver which can mimic almost every naturally occurring liver disease in man."

Disease does not occur naturally; as the 'new' explanation states, disease represents disruptions to the body's functions due to exposures to harmful substances and influences. The claim that the toxic effects of drugs 'mimic' disease is therefore disingenuous; their inherently toxic nature means that drugs are the cause of damage to the liver; in other words, they are the direct cause of 'liver disease'. This phenomenon is recognised by a 2010 article entitled *Drug-induced Liver Injury*, which states that,

"Drug-induced liver injury (DILI) is common and nearly all classes of medications can cause liver disease."

Although paracetamol (acetaminophen) is the drug most commonly associated with liver damage, the article refers to some of the other classes of 'medications' known to damage the liver,

"...a broad range of different pharmacological agents can induce liver damage, including anesthetics, anticancer drugs, antibiotics, antituberculosis agents, antiretrovirals, and cardiac medications."

This statement is an unambiguous admission that the substances used as 'medicines' to treat disease in the name of 'healthcare' are inherently toxic, and that, instead of restoring health, these 'medicines' cause damage to the liver, and thereby impair the activity

of the main organ that processes toxins and expels them from the body.

Although the medical establishment claims that medicines ‘work’ by actions that are intended to stimulate, block, depress, stabilise or otherwise correct bodily dysfunctions, it is clear that it is these ‘medicines’ that are the cause of dysfunctions, which the body’s self-healing mechanisms need to rectify. Unfortunately, however, the body’s ability to expel toxins, repair damage and restore health is almost invariably, albeit mistakenly, attributed to the drugs, as Herbert Shelton explains,

“It is these processes of resistance and expulsion and the processes by which damages are repaired that are mistaken for the actions of drugs.”

The only actions that drugs are capable of performing, involve the mechanism by which virtually all toxic substances are known to cause harm to the body at the cellular level, namely the generation of free radicals that induce oxidative stress; as indicated by a 2012 article entitled *Drug-Induced Oxidative Stress and Toxicity*, which states that,

“Drug-induced oxidative stress is implicated as a mechanism of toxicity in numerous tissues and organ systems...”

One of the organs known to be adversely affected by drug-induced oxidative stress is the liver, as demonstrated by the acknowledged presence of oxidative stress in ‘liver diseases’, such as hepatitis, cirrhosis and dysentery.

Furthermore, as indicated by the above cited 2010 article about DILI, antituberculosis agents are one of the classes of drugs recognised to induce liver damage; in other words, the drugs used to treat tuberculosis are known to be hepatotoxic. A 2018 article entitled *Oxidative Stress and First Line Antituberculosis Drug-Induced Hepatotoxicity* refers to the hepatotoxicity resulting from antituberculosis drugs as a ‘serious adverse reaction’ and states that,

“The association of oxidative stress with isoniazid-induced hepatotoxicity appears to be reasonably well understood.”

The failure of a patient to respond to first line TB drugs such as isoniazid is often interpreted to mean that the ‘bacteria’ have

developed 'resistance'; but, as previously discussed, this is an erroneous interpretation. The article states unequivocally that isoniazid induces hepatotoxicity and that this toxicity involves the mechanism of oxidative stress. This means that a patient's continuing, and often worsening, ill-health after treatment with isoniazid is due to hepatotoxicity and a reduction in the liver's ability to adequately process and eliminate this toxin. The problem of liver damage due to all types of pharmaceutical drugs is demonstrated by the 2010 article about DILI, which admits that,

“Indeed, drug-induced hepatotoxicity is the most frequent cause of acute liver failure in US.”

The reasons that drug-induced hepatotoxicity has become such a serious problem in the US are highlighted by an August 2017 article entitled *Too Many Meds? America's Love Affair With Prescription Medication*. This article refers to a study, which had shown that more than half of all Americans take at least one prescription medication, and states that Americans take far more 'pills' than the people of any other country. In addition, prescription drug use in America has risen dramatically in the past few years, as indicated by another August 2017 article entitled *Americans taking more prescription drugs than ever: a survey*, which states that, according to one 'health research firm',

“The number of prescriptions filled for American adults and children rose 85 percent between 1997 and 2016, from 2.4 billion to 4.5 billion per year...”

If pharmaceutical drugs were safe and effective, as the medical establishment claims them to be, then Americans ought to be the healthiest people in the world, but this is not the case; the discussion in chapter one referred to reports that show Americans to be some of the least healthy population of a 'developed' country. Furthermore, the harm caused by pharmaceuticals is also recognised by 'establishment' organisations, as indicated by the previously cited *Too Many Meds* article, which states that, according to estimates based on data from the CDC and FDA,

“Almost 1.3 million people went to U.S. emergency rooms due to adverse drug effects in 2014, and about 124,000 died from those events.”

The scale of adverse drug effects is a matter of serious concern. It is particularly significant with respect to the 2030 Agenda goal to ensure that everyone, everywhere has access to universal health coverage, and receives healthcare that includes the provision of 'essential' medicines and vaccines. Unfortunately, the toxic nature of these products will inevitably exacerbate health problems, not solve them.

Another group of 'harmful substances' to which people are commonly exposed are those collectively referred to as pesticides, the intended purpose of which is to destroy a wide variety of living organisms considered to be pests. Pesticides are therefore toxic by intent, but they are also toxic by definition; the origin of the suffix '-cide' is the Latin term that means to kill. The best-known types of pesticide are insecticides, herbicides, rodenticides and fungicides, but there are many others, which, according to the EPA web page entitled *Types of Pesticide Ingredients*, include antimicrobials, biocides, disinfectants and microbial pesticides, all of which are used to kill 'pathogenic microorganisms', especially bacteria and viruses. But viruses should not be referred to as 'organisms' as they are not alive, which means they cannot be 'killed'.

The EPA web page entitled *Basic Information about Pesticide Ingredients* states that pesticides contain both active ingredients, which disable or destroy the target pest, and inert ingredients, which perform other functions, such as extending the product's shelf-life, for example. Although the EPA evaluates the active ingredients and the overall product, inert ingredients only require EPA 'approval', because, as the page also states,

"Under federal law, the identity of inert ingredients is confidential business information."

Of particular note is the statement on the EPA web page that,

"The name 'inert' does not mean non-toxic."

Furthermore, inert ingredients are not required by US law to be identified on product labels; a situation that impedes independent scientific analysis of these ingredients to determine their potential adverse health effects either individually, or in combination with any other chemicals. Although these are US laws, it must be emphasised that the largest chemical companies are multinational corporations

and that, as discussed in chapter nine, most regulatory agencies are heavily influenced by corporate vested interests.

A variety of different pesticides are used in industrial agricultural practices, which is one of the most compelling reasons for choosing organically grown foods; however, pesticides are also used in the name of 'healthcare' to control, but mainly to kill, a number of different 'vectors' claimed to cause various diseases by transmitting the parasites they are said to carry. These vectors, many of which are insects, are described in the October 2017 WHO fact sheet entitled *Vector-borne diseases*, which states that,

“Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by mosquitoes, sandflies, triatomine bugs, blackflies, ticks, tsetse flies, mites, snails and lice.”

The diseases referred to include malaria, schistosomiasis, human African trypanosomiasis, leishmaniasis and Chagas disease, all of which were discussed in chapter eight. Although the WHO's response to these diseases involves the implementation of treatment and vaccination programmes, it also involves strategies to control the vectors, such as insecticide-treated nets and indoor residual spraying techniques. It is claimed that the problem of vector-borne diseases is worsening; as indicated by the 2017 WHO report entitled *Global Vector Control Response 2017-2030*, which states that,

“In recent years, vector-borne diseases have moved into new territory: many diseases once limited to tropical and subtropical zones are now increasingly seen in temperate zones.”

One of the stated goals of this report, which will be referred to as the *Vector Control* report, is to prevent epidemics of vector-borne diseases in all countries by 2030; this clearly aligns with the 2030 Agenda, the problems with which have been discussed.

The 'public health measures' claimed to prevent the spread of these vector-borne diseases include 'aircraft disinsection', which entails the use of insecticides to kill any insects that may have inadvertently entered an aircraft and prevent them from being introduced into other countries. Aircraft disinsection was first introduced in the 1940s to prevent the spread of malaria, although it

was restricted to countries most affected by this disease. The *Vector Control* report claims that ‘increased global travel’ is one of the factors that has enabled insect vectors to move into new territories and cause increased outbreaks of these diseases. Interestingly, however, a web page entitled *Aircraft Disinsection* on the EPA website states that,

“According to the Centers for Disease Control and Prevention (CDC), there is no evidence to show that using insecticide to kill mosquitoes inside aircraft cabins is effective in preventing introduction and spread of mosquito-borne disease.”

There is, however, a fundamental problem with the basic idea that aircraft carry these insects into ‘new territories’ where they cause disease. The discussion about malaria in chapter eight demonstrated that *Anopheles* mosquitoes, as well as the *Plasmodium* parasites they are claimed to carry, are ubiquitous; they inhabit every continent on the planet, with the sole exception of Antarctica.

Nevertheless, the 2030 Agenda goal to end the epidemic of malaria, in conjunction with the increasing focus on many other neglected tropical diseases, has encouraged the expansion of ‘aircraft disinsection’ programmes. The insecticides recommended by the WHO for use in these programmes are cited in the 2013 IPCS report entitled *Aircraft Disinsection Insecticides*, which states that,

“For aircraft disinsection, WHO currently recommends *d*-phenothrin (2%) for space spraying and permethrin (2%) for residual disinsection.”

Permethrin and phenothrin are synthetic pyrethroids that are claimed to be of ‘low toxicity’ to humans, but this does not mean that they are safe; however, the WHO web page entitled *Aircraft disinsection* states that,

“...WHO has found no evidence that the specified insecticide sprays are harmful to health when used as recommended.”

This statement is disingenuous, especially in view of the 2013 IPCS report that states,

“To date, no widely-accepted, peer-reviewed human health risk assessment model for aircraft disinsection insecticides has been available.”

It is clear that the information promulgated by the WHO contains many contradictions; the claims that there are no human health risks and that the risks have not been assessed, differ substantially from those of the *Healthy Environments* report, which acknowledges the toxicity of the insecticides used to 'manage' vectors and states that,

“The use of chemicals raises issues of human and animal toxicity, environmental pollution and sustainability as resistance remains a constant threat.”

The contradictory nature of the information promulgated by the WHO is further demonstrated by a comparison between the denial that insecticides are harmful to human health and the findings of a WHO-led consultation in July 2018, which were published in a report entitled *Methods and operating procedures for aircraft disinsection*. The report refers to concerns raised by some of the participants about the active ingredients in the insecticides used, and states that,

“...some can be detrimental to human health when applied in cabins.”

Despite the obfuscation by the WHO about the adverse health effects of the ingredients of 'aircraft disinsection' insecticides, there is a growing body of evidence that demonstrates their active ingredients, especially permethrin, to be harmful to human health; as indicated by a 2016 article entitled *Permethrin-induced oxidative stress and toxicity and metabolism. A review*, which states that it was originally believed that permethrin (PER) had 'low mammalian toxicity', but adds the comment that,

“However, as its use became more extensive worldwide, increasing evidence suggested that PER might have a variety of toxic effects on animals and humans alike...”

It would seem that the WHO website requires an urgent update to include this scientific evidence.

In common with all other toxic substances, the mechanism of action of permethrin's toxicity involves oxidative stress, as the article also states,

“A growing number of studies indicate that oxidative stress played critical roles in the various toxicities associated with PER.”

The article further states that the toxic effects of permethrin include neurotoxicity and reproductive effects. Permethrin-based insecticides are used for aircraft disinsection on flights involving countries said to be 'at risk' from the Zika virus, which is claimed to be transmitted by mosquitoes. It should be noted that the health problems claimed to be caused by this virus include 'neurological disorders' and 'neonatal malformations'; in other words, the Zika virus is claimed to cause exactly the same health problems that have been demonstrated to be caused by permethrin.

Previous discussions, especially those in chapter eight, demonstrate that so-called 'vector-borne' diseases are not caused by parasites transmitted by mosquitoes, or any other vector; instead, as the 'new' explanation states, disease is the result of exposures to 'harmful substances'.

Pharmaceuticals and pesticides are clearly not the only 'harmful substances' to which people are exposed, but the purpose of the foregoing discussions is to highlight the inappropriate use of products that contain toxic ingredients in the name of healthcare.

Despite the incessant media reports which erroneously claim that climate change due to high atmospheric levels of carbon dioxide poses the most serious threat to humanity, there is a small, but growing level of public awareness that the very real and far more serious threat to humanity is posed by environmental pollution caused by the toxic substances produced, used and discharged by many different industries. There is also a growing level of awareness amongst the research community that environmental pollutants are a significant contributory factor to human health problems; as indicated by a 2017 article entitled *Impact of nutrition on pollutant toxicity: an update with new insights into epigenetic regulation*, which states that,

“Exposure to environmental pollutants is a global health problem and is associated with the development of many chronic diseases...”

The only environmental pollutants specifically referred to in the article are POPs, heavy metals and air pollution, but there are many others. The article does however, refer to oxidative stress as the mechanism by which these pollutants exert their harmful effects.

The hazardous nature of the chemical ingredients of a wide variety of products commonly used in the home and workplace was discussed in chapter six, which also revealed that, although some have been tested individually and deemed 'safe', the vast majority of chemicals remain untested. More importantly, none of the combinations of chemicals to which people are regularly exposed has ever been tested for their safety or to determine their potential adverse health effects.

It may seem that the health hazards due to environmental pollution are of such a magnitude that it must be virtually impossible for anyone to be able to become and remain healthy; but this is not necessarily the case. As previously discussed, the body possesses innate mechanisms to expel toxins, repair damage and restore health. Although these mechanisms and the processes they regulate will be damaged and their effectiveness weakened by continual exposure to toxic substances, this damage can be mitigated, but it requires ongoing efforts to minimise exposures to toxic substances. It also requires ongoing efforts to maximise the intake of nutrients, especially antioxidants to counteract free radicals and prevent them from causing damage within the body.

Informed decisions can only be made when people are in possession of all the necessary information; therefore, in order to minimise and even avoid exposures to toxic substances, it is essential to know about all types of applications that utilise products that contain ingredients made from harmful substances. Whilst it may not be possible to completely avoid all toxins, it is certainly possible to avoid a significant proportion of them, especially those that are ingredients of products to which the body is directly exposed; these include products that are ingested and inhaled as well as those applied directly onto the body.

One group of products that are introduced directly into the body are those consumed as foods and drinks, although medicines and vaccines also fall into this category. The discussion about nutrition and water in the previous section demonstrates that a diet comprised of fresh, whole, organically-grown, plant-based foods is one that will maximise the intake of nutrients. This type of diet will also help to minimise the intake of toxins, as it will preclude the intake of the toxic

chemicals commonly used by industrial agricultural practices. Furthermore, in addition to boosting the intake of nutrients, a diet of this nature will also assist with detoxification; as explained by Dr Blaylock in *Health and Nutrition Secrets*,

“...numerous pesticides, herbicides, foreign organic chemicals, fluoride, mercury, aluminium, and other toxic substances are assaulting our bodies. All of these compounds must be detoxified, putting a heavy demand on our detoxification systems – all of which are dependent on nutrition.”

It must be noted that, in the same way that toxins accumulate in the body over the course of time, their elimination from the body will also require time; detoxification is therefore an ongoing process. In addition, it must be emphasised that the processes that expel toxins from the body often involve ‘symptoms’ that are commonly associated with ‘disease’; but, in accordance with the ‘new’ explanation, these symptoms must now be recognised as normal bodily processes, which means that they should not be ‘treated’ with pharmaceuticals.

Although certain programmes are promoted as methods to accelerate detoxification, they are not recommended, except in cases of acute poisoning with a highly toxic substance. One of the reasons to avoid such programmes is because the body’s detoxification organs are likely to have been compromised, which means that the elimination processes may not function as efficiently as they should. It is preferable, and safer, to allow the body to perform its detoxification processes naturally and to support these innate self-healing mechanisms by minimising the intake of toxins and maximising the intake of nutrients.

The main group of products that are regularly applied directly onto the body are cosmetics and personal care products, many of which, as previously discussed, contain toxic ingredients. But they are a source of toxic exposures that can be minimised and even avoided; as Dr Epstein explains in *Toxic Beauty*,

“Cosmetics and personal-care products today constitute our single largest but generally unrecognised class of avoidable exposure to toxic ingredients and their health dangers.”

The health dangers of the toxic ingredients used in many cosmetics and personal care products are no longer 'generally unrecognised'; instead, the problem has received sufficient attention that it has raised public awareness of and concern about these toxic chemicals. The adverse publicity this has generated has also been of such concern to the manufacturers of these products, that some have changed their formulations and replaced toxic ingredients, such as phthalates, parabens, SLS and SLES, with 'new' chemicals. But this has not always resulted in 'safer' products; some of the replacement chemicals have been found to be equally if not more toxic.

Fortunately, there are many new companies that are producing their own ranges of cosmetics and personal care products without toxic ingredients; information about these companies and their products can be found throughout the internet. The website of the Environmental Working Group (EWG), a US-based organisation, is one example of a useful resource with information about the toxic chemical ingredients of cosmetics and personal care products and about safer alternatives.

The Good Trade website is another example of a useful resource; as indicated by the information provided in the article entitled *10 Natural & Organic Makeup Brands Your Face Will Love You For*. People must, however, investigate for themselves the ingredients of the products they intend to purchase, especially as terms such as 'natural' may be used as marketing ploys, as indicated by the article that states,

“Many makeup brands marketed as ‘natural’ or ‘green’ are often not actually either of these things...”

One of the most powerful actions that people can take is to 'vote with your wallet'; to reject toxic products and support the manufacturers of safer, non-toxic products.

It is important to emphasise that the references in this section to websites that feature safer alternatives should not be construed as recommendations or as endorsements of any of the listed products, as this is not the case. These websites are included solely for the purpose of illustrating the kind of information that is available for people who wish to reduce their toxic exposures, and to enable them

to make informed decisions about the products they wish to purchase.

One of the myths listed on the EWG web page entitled *Myths on cosmetics safety* is the idea that chemicals are generally absorbed in only negligible amounts into the body. The EWG response to this myth includes reference to studies in which many toxic chemicals, such as phthalates, parabens and triclosan, have been found in significant amounts within the bodies of men, women and children. Furthermore, the discussion about 'poisoned bodies' in chapter six refers to the 2014 IPCS *Dermal Exposure* report, which admits that substances can cross the skin barrier and cause 'systemic effects', and exposes yet another medical establishment 'knowledge gap' in the statement that,

“For most chemicals, however, the relationship between dermal uptake and health effects observed elsewhere in the body is still poorly understood.”

It should be noted that, not only have many chemicals been recognised to penetrate the skin and enter the bloodstream, but that phthalates, parabens and triclosan are all associated with oxidative stress. This clearly provides a full explanation for the relationship between toxic chemicals applied to the skin and adverse health effects, despite the lack of understanding exhibited in the IPCS report.

Another large group of products that constitute a major source of toxic exposures are those utilised for tasks such as cleaning and general maintenance, whether in the home or workplace. Although these products contain a variety of different chemical ingredients, a significant proportion of them contain volatile organic compounds (VOCs), which are substances that are released as gases that can be inhaled; it is for this reason that some of the most common health effects of VOCs involve the respiratory system, although other important organs and systems can also be adversely affected.

The EPA web page entitled *Volatile Organic Compounds' Impact on Indoor Air Quality* states that the adverse health effects of VOCs include damage to the liver, kidneys and central nervous system, which is a clear demonstration of their hazardous nature. Two well-known VOCs are benzene and formaldehyde, both of which are

highly toxic chemicals that are known to exert their toxic effects through oxidative stress and the resulting cellular damage by free radicals. The types of products that may contain VOCs are listed on the EPA web page and include: paints, paint strippers and other solvents; cleansers and disinfectants; building materials and furnishings; and graphics and craft materials. Perchloroethylene, which is commonly used in dry-cleaning operations, is also a VOC.

Exposures to VOCs and many other toxic chemicals can, however, be minimised and even prevented as many safer products with less toxic or even non-toxic ingredients are available. The EWG web page entitled *Guide to Healthy Cleaning* for example, provides information about safer cleaning products available in the US. The Good Trade website also provides information about safer cleaning products, such as the article entitled *11 Natural & Eco-Friendly Cleaning Products For The Conscious Home*, for example. Many cleaning tasks can be performed using entirely natural materials; as indicated by the Organic Consumers Association article entitled *How Toxic Are Your Household Cleaning Supplies?* which states that,

“A few safe, simple ingredients like soap, water, baking soda, vinegar, lemon juice and borax, aided by a little elbow grease and a coarse brush for scrubbing, can take care of most household cleaning needs.”

Clothes are another group of products that are often manufactured using toxic materials and processes, as discussed in chapter six. Although some well-known clothing manufacturers have agreed to reduce the amount of toxic chemicals they use, there are many new companies that manufacture clothes using non-toxic materials, such as organic cotton, and safer processes using azo-free dyes, for example. The Good Trade web page entitled *35 Fair Trade and Ethical Clothing Brands Betting Against Fast Fashion* lists a number of these new clothing companies, most, but not all, of which are based in the US. A number of clothing companies based in Europe are listed on the Ecocult web page entitled *The Best Sustainable and Ethical European Fashion Brands*. There are also safer alternatives for soft furnishings and bedding; as indicated by The Good Trade web page entitled *10 Organic Sheets and Bedding Sources To Help You Sleep Sweetly*.

Plastics are another group of toxic materials that are widely used to make a huge variety of products, containers and wrapping materials; the hazardous nature of plastics and their lack of biodegradability were discussed in chapter six. There is, however, a growing level of public awareness of the problem of environmental pollution due to plastics. There is also an increasing variety of products that are made without plastics; the Life Without Plastics website, for example, features a number of plastic-free products. The Recycling website also features a variety of plastic-free products available in the US on a page entitled *Kickstart Your Zero Waste Lifestyle*. Plastic-free products available in the UK are featured on the website of The Plastic Free Shop.

It is abundantly clear from the discussion in this section that toxic chemicals are entirely unnecessary for the manufacture of a huge variety of products and that there are safer, less toxic alternatives for many of the products people use on a regular, if not daily basis. It is equally clear that choosing safer alternatives will contribute to a significant reduction in each person's level of toxic exposures.

EM Radiation Exposures

Electromagnetic radiation is a form of energy that extends over a range of frequencies and wavelengths collectively known as the electromagnetic spectrum. Although different sections of the spectrum have been given different labels, such as visible light and microwaves, for example, all forms of electromagnetic radiation are categorised as either ionising or non-ionising according to the intensity of the energy they possess.

As previously discussed, the Earth has always existed in the presence of a low level of ionising radiation, known as 'natural background radiation', that occurs as the result of a combination of the radioactivity emitted by naturally-occurring radioactive materials, within or beneath the Earth's crust, and the presence in the atmosphere of cosmic radiation emitted by the sun and stars. Although the background level had been gradually augmented due to radioactive materials released by activities such as mining, it was profoundly altered in the mid-20th century as the result of the development, testing and use of nuclear weapons. Environmental levels of ionising radiation have continued to rise mainly as the result

of the ongoing operations of the nuclear industry, especially nuclear power plants. There are other applications of ionising radiation that have contributed to the increased level of exposure; as indicated by the April 2016 WHO fact sheet entitled *Ionizing radiation, health effects and protective measures* that states,

“Ionizing radiation has many beneficial applications, including uses in medicine, industry, agriculture and research.”

The natural electromagnetic environment has also been altered by ‘unnatural’ non-ionising radiation, the level of which began to increase after the introduction of AC (alternating current) electricity as the main power source for virtually all machines and equipment, both domestic and industrial. As previously discussed, all electrical equipment and appliances that utilise electricity produce electromagnetic fields (EMFs). Environmental concentrations of EM radiation have further increased, and more rapidly, since the latter part of the 20th century as the result of the new technologies developed by the telecommunications industry, such as mobile phones and wireless communications, that utilise electromagnetic frequencies in the RF and ELF ranges.

It is clear that the Earth’s electromagnetic environment has been irrevocably altered at an incredibly rapid pace and over the course of an incredibly short period of time. Dr Robert Becker MD describes the situation in his 1990 book *Cross Currents*,

“Today, we swim in a sea of energy that is almost totally man-made.”

The problem with this man-made sea of energy is that it interferes with the functioning of the natural electrical systems of living organisms, especially humans. In their book entitled *Earthing: The Most Important Health Discovery Ever!* co-authors Clinton Ober, Martin Zucker and Stephen Sinatra MD explain that,

“We all live and function electrically on an electrical planet.”

Interestingly, there is a growing body of compelling evidence that indicates the entire universe is fundamentally electrical in nature.

Human health can be adversely affected by exposures to ‘harmful influences’, such as ‘man-made’ electromagnetic radiation, as well as ‘harmful substances’, such as ‘man-made’ chemicals. Although the chemical industry justifies the production and use of synthetic

chemicals on the basis of the claim that 'everything is made of chemicals', this claim is misleading because 'matter' is also electrical in nature.

All matter is composed of atoms and each atom is composed of a combination of three main subatomic particles, namely, protons, neutrons and electrons. The nature of each chemical element is determined by its atomic structure; a hydrogen atom, for example, contains one proton and one electron, whereas a carbon atom contains six protons and six electrons. The electrical aspects of matter are, however, primary because all subatomic particles have electrical properties; protons have a positive electrical charge and electrons a negative charge. Neutrons are said to have equal negative and positive charges which balance each other to produce an overall neutral charge. In most atoms, the number of protons equals the number of electrons, which means there will be no overall electrical charge; but if proton and electron numbers are not equal, the atom will have a charge. An electrically charged atom or molecule is known as an ion.

Ions are produced by different processes, one of which, known as 'dissociation', refers to the separation of chemical compounds into smaller particles, including ions, when dissolved in a liquid. Sodium chloride, for example, will dissolve in water and separate into positive sodium ions and negative chloride ions. Within the body, however, ions, or electrolytes as they are also called, perform important functions that include transmitting an electrical current across the cell membrane. A number of important minerals, especially sodium, potassium, calcium and magnesium, are also electrolytes, which means that they are of extreme importance to the maintenance of electrical homeostasis as well as chemical homeostasis.

It is clear that, although electrical properties are primary, the electrical and chemical aspects of matter are intimately interconnected; it is therefore more accurate to state that 'everything', including the human body, is electro-chemical in nature.

Ions are also produced by ionising radiation, which involves a very different process from dissociation; as previously discussed, ionising radiation possesses sufficient energy to break molecular bonds and

release free electrons. However, although 'free electrons' are also known as 'free radicals', those produced by ionising radiation are far more dangerous to living cells. In his 1997 article entitled *The Free-Radical Fallacy about Ionizing Radiation*, Dr John Gofman MD explains that,

"Ionizing radiation instantly unloads biologically abnormal amounts of energy at random in an irradiated cell."

It is the release of 'abnormal amounts' of energy in a very short period of time that results in adverse effects that occur almost immediately; as indicated by the previously cited WHO *Ionizing radiation* fact sheet, which states that,

"Acute health effects such as skin burns or acute radiation syndrome can occur when doses of radiation exceed certain levels."

The CDC web page entitled *Acute Radiation Syndrome: A Fact Sheet for Clinicians* defines 'acute radiation syndrome' as an acute 'illness' and states that this condition, which is also known as radiation toxicity and radiation sickness, occurs as the result of exposure to a high dose of penetrating radiation. The page cites the survivors of the Hiroshima and Nagasaki atomic bombs as people who would have suffered from this 'illness'; it is however, wholly inappropriate to describe the horrifying effects of ionising radiation from nuclear bombs as either an illness or a syndrome.

Unfortunately, the medical establishment operates from the basis of the idea that 'disease-causing entities' must be destroyed. Their arsenal of weapons to defeat these entities includes certain forms of ionising radiation that are used to treat certain diseases, especially cancers. Although the use of ionising radiation is believed to be 'beneficial', because it is said to destroy the cancer without killing the patient, the fact sheet nevertheless acknowledges that,

"Low doses of ionizing radiation can increase the risk of longer term effects such as cancer."

In other words, the treatment is recognised to cause the very 'disease' for which it is used as a remedy; however, no 'dose' of radiation has the ability to restore a person to health. The discussion in chapter six cites Dr Karl Z Morgan PhD, who stated in 1978 that,

“There is no safe level of exposure and there is no dose of radiation so low that the risk of a malignancy is zero.”

Nevertheless, low doses or exposures do not inevitably lead to cancer. The likelihood that a person will develop cancer, or any other ‘chronic disease’, is not a matter of ‘risk’ or ‘chance’ or even ‘genes’. It is entirely dependent on each individual’s unique health status, which will be influenced by the degree to which they are affected by all of the ‘four factors’ discussed in this chapter.

In common with all other ‘harmful substances and influences’, electromagnetic radiation exerts its adverse effects through the mechanism of oxidative stress that induces free radical damage at the cellular level; EM radiation is, however, particularly detrimental to the organs and systems that operate electrically. One of the main organs that function electrically is the heart; it is therefore unsurprising that, as discussed in chapter seven, a relationship exists between exposures to EMFs, oxidative stress and cardiac problems. It is important to emphasise that the body’s electrical system only requires very tiny amounts of electrical energy; as indicated by the previously cited statement by Dr Becker in *Cross Currents*,

“The body’s internal energetic control systems are subtle, and they operate with minute amounts of electromagnetic energy.”

The body’s delicate electrical system can be, and invariably is, disrupted by unnatural electromagnetic fields.

The degree of harm that may result from exposures to low levels of non-ionising EM radiation will depend on each person’s health status, which includes their unique body burden of toxins. Interestingly, there is evidence that a synergistic relationship exists between toxic chemicals and non-ionising EM radiation; as indicated by the EHT article entitled *Wireless Radiation/Electromagnetic Fields Increases Toxic Body Burden*, which refers to the known adverse health effects of toxic chemicals and states that,

“In addition, wireless and EMF radiation can synergistically increase the effect of these daily toxic exposures...”

The mechanism by which toxins and EM radiation interact synergistically is not known, but may relate to the fact that they both

exert their effects through the generation of free radicals. Of particular concern, however, is that EM radiation has been shown to affect the blood-brain barrier, as the article also states,

“...replicated research shows that wireless radiation increases the permeability of the blood-brain barrier, allowing more movement of toxic chemicals into vulnerable organs.”

The brain is extremely important; it is the other main organ that functions electrically. Many of the implications, and indeed some of the consequences, for the brain from the synergistic interactions between EM radiation and toxic chemicals were referred to in the discussion about autism. The most significant consequences will be for children, whose brains are particularly vulnerable as they are still undergoing development; however, neurological problems are not exclusive to children; they can also affect adults.

It is important to emphasise that the body is not defenceless against ‘harmful substances and influences’; it possesses many mechanisms that respond to their presence. One of these mechanisms, known as the ‘cellular stress response’, is discussed by Professor Martin Blank PhD, with particular reference to the cellular response to EM radiation, in his article entitled *The Cellular Stress Response: EMF-DNA Interaction* published in the BioInitiative Report 2012. In this article, which will be referred to as the *Stress Response* article, he states that,

“The cellular stress response is a protective reaction of individual cells to potentially harmful stimuli in the environment. It is characterized by the synthesis of a class of proteins referred to as stress proteins.”

The cellular stress response is not the same as the body’s production of hormones in response to ‘stress’, which is discussed in the next section.

The first stimulus discovered to induce the cellular stress response is heating, which is the reason that these proteins were initially called heat shock proteins. These proteins are described in a 2004 article entitled *‘The stress of dying’: the role of heat shock proteins in the regulation of apoptosis*, which states that,

“Heat shock proteins (Hsps) are a family of highly homologous chaperone proteins that are induced in response to

environmental, physical and chemical stresses and that limit the consequences of damage and facilitate cellular recovery.”

The acknowledgement that a variety of different ‘stresses’ induce the same cellular response further validates the ‘new’ explanation that asserts diseases are not separate ‘entities’, but merely different manifestations of cellular damage and the resulting bodily dysfunctions.

As the above article indicates, the cellular stress response can be induced by stimuli other than heating; however, non-thermal stimuli can induce this response at exposure levels that are orders of magnitude lower than those at which the tissues would be heated; as Professor Blank also states in his *Stress Response* article,

“In fact, the cells were far more sensitive to EMF than to thermal stimuli, the threshold energy of the EMF stimulus being more than one billion times weaker than an effective thermal stimulus.”

Despite this evidence, the WHO continues to assert that tissue heating is the main adverse health effect of non-ionising radiation; as indicated by the October 2014 fact sheet entitled *Electromagnetic fields and public health: mobile phones*, which, as previously cited, states that,

“Tissue heating is the principal mechanism of interaction between radiofrequency energy and the human body.”

The ICNIRP guidelines that claim to protect people from the effects of non-ionising radiation have set thresholds at levels that would prevent tissue heating on the basis that this is the only relevant adverse effect. The WHO web pages relating to the topic of *Electromagnetic fields* include an undated page entitled *Research*, which refers to research into the health effects of exposures to EM radiation and states that,

“All reviews conducted so far have indicated that exposures below the limits recommended in the ICNIRP (1998) guidelines, covering the full frequency range from 0-300 GHz, do not produce any known adverse health effects.”

Although the page recognises the existence of some ‘knowledge gaps’ that need to be filled, the claim that there are no known adverse health effects is disingenuous. RF and ELF are both

classified by the IARC as Group 2B carcinogens, which means they are both officially recognised as ‘possible’ human carcinogens. This classification challenges the claim that tissue heating is the only relevant adverse health effect.

The ICNIRP guidelines, now more than two decades old, are wholly inadequate to genuinely protect people, as they fail to reflect ongoing scientific research findings that continue to conclusively demonstrate the existence of serious non-thermal effects at exposure levels below those deemed to be safe by the governing bodies. Unfortunately, the WHO, ICNIRP and all other ‘establishment’ organisations that make pronouncements about the health effects of exposures to EM radiation, fail to acknowledge these non-thermal effects, mainly as the result of the influence of ‘vested interests’, especially those of the telecommunications and related industries.

A December 2018 article entitled *Planetary electromagnetic pollution: it is time to assess its impact* refers to the proliferation of artificial electromagnetic fields and states that,

“The most notable is the blanket of radiofrequency electromagnetic radiation, largely microwave radiation generated for wireless communication and surveillance technologies, as mounting scientific evidence suggests that prolonged exposure to radiofrequency electromagnetic radiation has serious biological and health effects.”

The classification of RF and ELF as merely ‘possible’ carcinogens is no longer tenable; there is a large body of evidence, which demonstrates that a relationship exists between EM radiation and oxidative stress, cellular damage and cancer, and that this relationship is both direct and causal. A May 2018 article entitled *Radiofrequency radiation from nearby base stations gives high levels in an apartment in Stockholm, Sweden: A case report* states that,

“RF radiation leads to oxidative stress in biological systems, including the brain, due to an increase in free radicals and changes in antioxidant defence systems.”

The article refers to studies that have shown radiofrequency radiation to increase the risk of cancer and have resulted in

recommendations that RF radiation be upgraded from Group 2B to Group 1, the category for known human carcinogens.

The thresholds set by the ICNIRP guidelines are clearly in urgent need of revision, as Professor Blank emphasises in his *Stress Response* article,

“It should be obvious that EMF safety standards are based on false assumptions and must be revised to reflect the scientific evidence.”

Unfortunately, the continually growing body of evidence that demonstrates exposures to non-ionising EM radiation to be associated with serious adverse health effects, is largely ignored by the telecommunications and related industries that are preparing for the imminent introduction of 5G, the fifth generation of wireless infrastructure, which is intended to facilitate the implementation of the Internet of Things (IoT). It must be emphasised that 5G will augment, not replace, existing 2G, 3G and 4G technologies.

There are many concerns about 5G and its related infrastructure and technologies, one of which is that it will raise the existing concentration of electromagnetic radiation in the environment to unacceptable levels. The frequencies to be used for 5G are at the high end of the radiofrequency section of the spectrum; these high frequency radio waves are also known as millimetre waves (MMW), due to their wavelength. But 5G will not be the first application of this range of frequencies, as MMWs are currently employed in airport body scanners used in a number of countries, most notably the US. These scanners are claimed to be ‘safe’ because they are low in energy; as indicated by the CDC web page entitled *Radiation from Airport Security Scanning*, which states that,

“This form of technology uses low-energy non-ionizing radiation that releases thousands of times less energy than a cell phone.”

This does not mean that they do not produce any adverse health effects. As discussed in chapter six, the military utilise MMWs in Active Denial Systems for applications such as crowd control, because they are known to produce extremely unpleasant sensations within the skin; sensations that are intended to

discourage people from remaining within the vicinity of the source and to encourage them to disperse.

It is claimed that MMWs only heat the skin, but as has been repeatedly shown, adverse health effects from exposures to non-ionising radiation occur at levels orders of magnitude lower than those at which heating occurs. In his February 2019 article entitled *5G Wireless Technology: Millimeter Wave Health Effects*, Dr Joel Moskowitz PhD explains that MMWs are,

“...mostly absorbed within 1-2 millimeters of human skin...”

This seemingly superficial level of absorption into the skin does not mean that the rest of the body will remain unaffected; as he further explains,

“Since skin contains capillaries and nerve endings, MMW bio-effects may be transmitted through molecular mechanisms by the skin or through the nervous system.”

The implementation of 5G, and its related infrastructure and technologies to facilitate the interconnection of all devices that utilise SMART (Self-Monitoring Analysis and Reporting Technologies) systems through the IoT, will clearly intensify the existing concentration of ‘unnatural’ EM radiation. In common with all previous generations of wireless technologies, however, 5G is to be implemented without a full investigation of the potential consequences for human health, as Dr Moskowitz states,

“Unfortunately, few studies have examined prolonged exposure to low-intensity MMWs, and no research that I am aware of has focused on exposure to MMWs combined with other radiofrequency radiation.”

Fortunately, 180 scientists concerned about the implementation of 5G in the absence of safety studies have signed a declaration addressed to the European Commission. The previously cited EHT web page entitled *Scientists And Doctors Demand Moratorium On 5G Warning of Health Effects* explains that this declaration requests the Commission to recommend a moratorium on the implementation of 5G,

“...until potential hazards for human health and the environment have been fully investigated by scientists independent from industry.”

However, sufficient evidence has already accumulated to demonstrate that exposures to electromagnetic radiation in the radiofrequency range is extremely detrimental, not only to humans but to all living organisms, mainly as the result of oxidative stress, the underlying mechanism common to virtually all conditions of ill-health.

Although exposures to certain forms of EM radiation may be unavoidable, other sources of exposure can be avoided or minimised. According to the WHO, most exposures to ionising radiation are the result of medical examinations and diagnostic procedures; X-rays and CT scans for example; these exposures are avoidable. Other sources of exposure to ionising radiation, such as nuclear power plants and uranium mines for example, may not be so easy to avoid, particularly for people who work in these industries or live in their vicinity.

The phenomenal expansion in technologies that employ EM radiation in the radiofrequency range have profoundly changed the nature of the electromagnetic environment throughout the world. Although the wireless communications systems on which mobile phones and other devices depend are ubiquitous, they are higher within urban areas. Each person's exposure to non-ionising radiation will therefore depend, to a large extent, on where they live and work and on the nature of the devices, equipment and wireless systems they use, as well as those to which they are involuntarily exposed.

It is important to emphasise that the body's electrical system operates using currents that flow in only one direction, which is referred to as direct current (DC). Mains electricity, by contrast, operates with alternating current (AC) electricity, which means that electric current flows change direction. All electrical equipment and appliances produce electromagnetic fields in the ELF (extremely low frequency) range that interfere with the body's delicate electrical system and are associated with a number of adverse health effects, including leukaemia and brain tumours. As previously mentioned, the IARC has classified ELF EM radiation as a Group 2B 'possible' human carcinogen.

One particularly useful source of information about a wide variety of topics pertaining to EM radiation exposures is the Powerwatch

website. In the section of the website labelled *Article library* are many different publications available for download. The *Child Cancer* section, for example, includes a publication entitled *Ionising radiation* that discusses diagnostic X-rays and CT scans and explains that CT scans give a higher dose of ionising radiation than X-rays.

In the section entitled *Powerfrequency EMFs and Health* is a publication entitled *Cellular changes and potential mechanisms* that refers to ‘free radical effects’ that can affect the ‘brain oxidative balance’ which could lead to the reduction of melatonin, a powerful antioxidant. The consequences of reduced melatonin levels are discussed by Dr Neil Cherry in his 2002 article entitled *EMF/EMR Reduces Melatonin in Animals and People*, which, although previously cited in chapter six, deserves repetition,

“...reduced melatonin output causes many serious biological effects in humans and other mammals, including sleep disturbance, chronic fatigue, DNA damage leading to cancer, cardiac, reproductive and neurological diseases and mortality.”

The Powerwatch website also contains a number of other publications relating to exposures to EM radiation in the home from various appliances and equipment, as well as outside the home, from sources such as phone masts. In addition to information about the sources of exposure and the scientific studies that have investigated the effects, the website also offers advice about reducing exposures.

The most widely used device is the mobile phone, it is also the most widely studied; the adverse effects on the brain, especially tumours, are well documented. The EHT website is another source of useful information and downloadable documents, not only about the hazards but also advice about reducing exposures, such as the page entitled *10 Tips To Reduce Cell Phone Radiation*. The document entitled *What You Need To Know About 5G Wireless and ‘Small Cells’* explains that safer alternatives exist and states that,

“Worldwide, many regions are investing in wired, fiberoptic connections which are safer, faster, more reliable, provide greater capacity and are more cyber-secure.”

The body is an electrical system that needs to be maintained in the state of homeostasis, which can be assisted by making direct

contact with the Earth; this is discussed in the *Earthing* book referred to at the beginning of this section. However, although the authors of *Earthing* do not claim that making direct contact with the Earth reduces the effects of EM radiation, they do claim that ‘grounding’ helps to restore electrical homeostasis and that,

“...Earthing naturally protects the body’s delicate bioelectrical circuitry against static electrical charges and interference.”

EM radiation mainly exerts its effects via oxidative stress that increases the generation of free radicals and reduces the effectiveness of the body’s natural antioxidant system. These effects can, however, be mitigated by efforts to support the body, especially the regular consumption of antioxidant-rich foods. It is, of course, extremely important to pay attention not only to nutrition, but to all of the ‘four factors’ discussed in this book, including ‘stress’, the fourth factor and the topic of the next section.

Stress

The general understanding of stress is described by the Oxford Dictionary that refers to,

“mental or emotional strain or tension.”

In this context, stress is an effect. The establishment definition provided by the Oxford Concise Medical Dictionary, by contrast, describes stress as a cause; as indicated by the reference to stress as,

“any factor that threatens the health of the body or has an adverse effect on its functioning, such as injury, disease, or worry.”

In addition to their descriptions of seemingly different phenomena, these definitions only refer to the ‘negative’ connotations of stress. But this is misleading; stress also has ‘positive’ connotations, as indicated by a 2005 article entitled *Stressed or stressed out: What is the difference?* which states that,

“For some, it means excitement and challenge (‘good stress’); for many others, it reflects an undesirable state of chronic fatigue, worry, frustration and inability to cope (‘bad stress’).”

Dr Hans Selye MD, who is widely regarded as one of the key pioneers in this field of research, refers to stress as an effect; as indicated by his definition of the term in his book entitled *The Stress of Life* as,

“...the nonspecific response of the body to any demand, whether it is caused by, or results in, pleasant or unpleasant conditions.”

In order to distinguish between causes and effects, Dr Selye created the term ‘stressor’ to refer to causal factors and retained the term ‘stress’ to refer to the effects, as indicated by his definition. In order to differentiate between its positive and negative connotations, he created the term ‘eustress’ to refer to ‘good stress’ and employed the term ‘distress’ to refer to ‘bad stress’. These are the terms and the context in which they will be used in the ensuing discussion.

Distress is associated with emotions, such as fear, worry and the inability to cope, that arise as the result of tragic life events, such as the death of a loved one, or situations that pose a direct threat to life, such as a war, for example. Eustress is associated with emotions such as joy, excitement and exhilaration that can result from pleasantly challenging life events, such as a new career opportunity, although for some people events of this nature may generate ‘distress’.

Dr Selye explains that any ordinary, everyday activity or emotion that places a demand on the body can be regarded as a stressor; the resulting ‘stress’ in this context, is therefore perfectly normal and unlikely to be detrimental to health. Eustress and distress are not the same as this normal stress; they represent a heightened level of stress caused by stressors that are not part of ordinary, everyday life. However, although eustress and distress represent increased demands on the body, they are not associated with the same effects; eustress is often regarded as beneficial, whereas distress is widely regarded as damaging to health, especially when prolonged.

The body’s response to stressors is said to involve the ‘fight or flight’ response, also known as the ‘acute stress response’, which triggers the endocrine system to secrete high concentrations of certain hormones, especially cortisol and adrenaline (epinephrine), and the nervous system to release certain neurotransmitters, such

as serotonin. Interestingly, adrenaline acts as a neurotransmitter and a hormone.

The purpose of these secretions is to provide a surge of energy to enable the body to react swiftly to a 'non-ordinary' stressor, especially a situation that induces emotions such as fear that can precipitate distress. When the stressor has been resolved or removed, the level of secretions gradually returns to normal and the body is restored to its normal state of homeostasis. If the stressor is not rapidly resolved or removed, the body will continue to release hormones and neurotransmitters, which, at certain elevated levels, are associated with adverse health effects, including neurological effects; an elevated cortisol level, for example, is associated with depression.

Neurological effects are not, however, solely the result of emotional stressors; they can also be caused by physical stressors, such as toxic chemicals and EM radiation, both of which are known to adversely affect the nervous system; as indicated by the 2014 Supplement to the BioInitiative Report entitled *Neurological Effects of Non-Ionizing Electromagnetic Fields*, which states that,

“Factors that act directly or indirectly on the nervous system causing morphological, chemical, or electrical changes in the nervous system can lead to neurological effects.”

It is claimed that at certain low doses or exposures, toxic chemicals and EM radiation do not produce adverse effects, but this is misleading; claims of this nature completely ignore subtle effects at the cellular level; as Dr Blaylock MD explains in *Health and Nutrition Secrets*,

“...subtle toxicities can disrupt cellular function without producing obvious clinical toxicity – a condition known as subclinical toxicity.”

Subclinical toxicity may also produce actual symptoms, but not of the type to be regarded as clinically significant. Symptoms of this nature are likely to be ignored on the grounds that they are not indicative of a 'disease' recognised by the medical establishment, whose attitude towards people with MCS and EHS was discussed in chapter seven. Dr Blaylock describes some of the symptoms that may be experienced,

“Rather than obvious signs such as nausea, vomiting and abdominal cramps, some people may experience no more than vague feelings of fatigue, cloudiness of thought, memory lapses, irritability, depression, or minor aches and pains...”

Sadly, few doctors are likely to recognise that obvious symptoms, such as nausea and vomiting, can result from the ingestion of toxins; most of them will ascribe such symptoms to a ‘germ’ of some description. Dr Blaylock also explains that doctors are largely unfamiliar with signs of ‘subclinical toxicity’. This means that they are even less likely to associate subtle symptoms, such as ‘cloudiness of thought’ for example, with exposures to toxins or EM radiation; they are far more likely to associate these symptoms with a mental health problem.

The failure of physicians to recognise symptoms to be the result of exposures to ‘harmful substances and influences’ is due to their medical training, which only teaches them to recognise certain symptoms or symptom-complexes as indicative of the presence of a specific ‘disease’, the cause or causes of which may not even be known. Their training also extends to the recognition of certain symptoms and symptom-complexes as indicative of conditions referred to as ‘mental illnesses’, now known as ‘mental disorders’, the prevalence of which, according to the April 2018 WHO fact sheet entitled *Mental disorders*, is increasing,

“The burden of mental disorders continues to grow with significant impacts on health and major social, human rights and economic consequences in all countries around the world.”

The fact sheet refers to some of the conditions included in this category and states that,

“Mental disorders include: depression, bipolar affective disorder, schizophrenia and other psychoses, dementia, intellectual disabilities and developmental disorders including autism.”

The problems with the reference to depression as a ‘mental disorder’ were discussed in chapter one; the erroneous nature of the idea that autism is a ‘mental disorder’ was discussed in chapter seven. There are clearly similar problems with all of the other ‘disorders’ listed above; dementia is discussed later in this section.

The basic features of the conditions referred to as 'mental disorders' are described by the fact sheet that states,

"They are generally characterized by a combination of abnormal thoughts, perceptions, emotions, behaviour and relationships with others."

As discussed in chapter one, the reference to 'abnormal' presupposes the existence of a clearly defined description of 'normal'; but this is not the case. Although it may be appropriate to describe certain behaviours as unacceptable, it is inappropriate to attribute them to a mental illness. More importantly, it ought to be a matter of profound concern to everyone that any 'authority' possesses the right to determine the parameters of 'normal' in order to ascertain what can be described as 'abnormal'; especially with respect to people's thoughts, perceptions and emotions.

Interestingly, and as previously cited, the fact sheet claims that the factors that contribute to mental disorders also include stress and exposure to environmental hazards; the discussion in this section demonstrates these to be the major causal factors of neurological problems. The treatments recommended by the WHO for 'mental disorders' do not however, include measures to properly address these factors. Instead, treatments for many, but not all, of these conditions, include the use of psychoactive drugs to correct a 'chemical imbalance in the brain' that is claimed to be the main cause of these disorders; the erroneous nature of this claim was discussed in chapter one.

Psychoactive drugs are entirely inappropriate as treatments, not only because they are unable to correct a problem that has never been proven to exist, but also because they are known to cause severe harm to the brain. In his previously cited article entitled *Rational Principles of Psychopharmacology for Therapists, Healthcare Providers and Clients*, Dr Breggin refers to,

"...the brain-disabling principle, which states that all psychoactive substances work by causing dysfunctions of the brain and mind."

It can be seen that, yet again, medical 'treatments' have the ability to cause the very problems they are intended to remedy.

It is extremely important to reiterate that, as Dr Breggin states in his article,

“Withdrawing from psychiatric drugs can be emotionally and sometimes physically dangerous. It should be done carefully with experienced supervision.”

Another reason that psychoactive drugs are an inappropriate remedy for ‘mental disorders’ is because they are utterly incapable of addressing any underlying emotional problems that may have precipitated the ‘distress’. As previously stated, problems can only be resolved by addressing their cause or causes. Unfortunately, however, pharmaceuticals have become widely accepted as the panacea for many forms of ‘distress’; as Dr Breggin explain in his article,

“A huge portion of the general population accepts that psychiatric drugs are the answer to everyday problems from fatigue and a broken heart to conflicts in the family between parents and their children.”

Children who conflict with their parents, or other adults, may be diagnosed with a condition known as ODD (oppositional defiant disorder), which is generally described as a behavioural disorder, in which children display hostility, disobedience and defiance, often towards adult ‘authority’ figures. The medical establishment does not know what causes children to exhibit such behaviours, but a diagnosis of ODD requires the behaviours to have persisted for more than six months; temporary tantrums are therefore excluded.

Although children who exhibit these behaviours may have emotional problems that can be addressed through non-pharmaceutical-based therapies, they may also be affected by factors that are entirely unrelated to emotional problems. The most significant of these other factors are exposures to substances and influences that cause harm to the nervous system and produce neurological effects. The substances that can impair neurological functioning include various food additives, such as the chemicals used as food colourings and preservatives, as discussed in chapter six. Other sources of chemicals that impair neurological functioning, especially of children, include vaccines, many of which contain neurotoxic ingredients, as also previously discussed. The influences

that can adversely affect the nervous system and cause neurological harm include RF-EMFs; children who use, or play with, mobile phones for example, will be exposed to the harmful radiofrequency EM radiation they emit.

Older people are another sector of the population claimed to be affected in large numbers by 'mental disorders'; the most common condition with which people over the age of 65 are diagnosed is dementia, which is described by the WHO May 2019 fact sheet entitled *Dementia* as,

“...a syndrome in which there is deterioration in memory, thinking, behaviour and the ability to perform everyday activities.”

Although more common in older people, dementia is not solely a problem for people over the age of 65. More importantly, as the fact sheet acknowledges, dementia is not an inevitable consequence of ageing; many people older than 65 do not experience a deterioration in their mental faculties. The fact sheet does not identify the causes of dementia but instead, states that,

“Dementia results from a variety of diseases and injuries that primarily or secondarily affect the brain, such as Alzheimer’s disease or stroke.”

In addition to the statement that dementia can result from Alzheimer’s disease, the fact sheet also states that Alzheimer’s disease is the most common form of dementia. But this is highly anomalous because it suggests that one of the most common forms of dementia is a cause of dementia.

Interestingly, although unsurprisingly, the fact sheet attempts to associate cognitive impairments, including dementia, with the same ‘risk factors’ associated with ‘physical’ diseases, as indicated by the statement that,

“Studies show that people can reduce their risk of dementia by getting regular exercise, not smoking, avoiding harmful use of alcohol, controlling their weight, eating a healthy diet, and maintaining healthy blood pressure, cholesterol and blood sugar levels.”

The problems with this statement have been discussed; however, the fact sheet claims that other ‘risk factors’ are also involved and

states that,

“Additional risk factors include depression, low educational attainment, social isolation and cognitive inactivity.”

In the same way that the medical establishment explanations about ‘physical’ diseases are flawed, those pertaining to ‘cognitive impairments’ are also flawed; they can however, be explained by reference to the ‘new’ explanation of disease. Cognitive impairments, including those referred to as ‘mental disorders’, are manifestations of dysfunctions, especially within the nervous system and the brain, resulting from exposures to ‘harmful substances and influences’. In some instances, these exposures may have occurred prior to birth, as indicated by the discussions about the endocrine system and birth defects in chapter seven.

Significantly, the mechanism by which stressors exert their harmful effects is the same as all ‘harmful substances and influences’, namely, oxidative stress, which has been shown to be associated with a number of ‘mental disorders’, as discussed in a 2009 article entitled *Oxidative stress and anxiety* which states that,

“Oxidative damage in the brain causes nervous system impairment. Recently, oxidative stress has also been implicated in depression, anxiety disorder and high anxiety levels.”

One of the most common symptoms caused by the tensions and anxieties associated with ‘distress’ is a headache. However, although headaches are recognised to be associated with the nervous system and neurological problems, they have been redefined as ‘disorders’; as indicated by the April 2016 WHO fact sheet entitled *Headache disorders*, which states that,

“Headache disorders are among the most common disorders of the nervous system.”

The fact sheet claims that there are four types of ‘headache disorder’: migraine; tension-type headache; cluster headache; and medication-overuse headache. Although persistent headaches are clearly debilitating, it is inappropriate to refer to them as ‘disorders’. It is important to emphasise that headaches are one of the most common ailments for which people self-medicate; however, in common with all other ‘medicines’, over-the-counter pain-killers do not resolve or address the underlying problem. The category referred

to as 'medication-overuse headache' is yet another demonstration that treatments are capable of causing the very problem they are intended to remedy.

An increasing number of studies have discovered that oxidative stress is a feature of the most common 'mental disorders'; as indicated by a 2014 article entitled *Oxidative Stress and Psychological Disorders*, which also states that,

“...the fact that oxidative stress is implicated in several mental disorders including depression, anxiety disorders, schizophrenia and bipolar disorder, is not surprising.”

However, a 2013 article entitled *Good Stress, Bad Stress and Oxidative Stress: Insights from Anticipatory Cortisol Reactivity* makes the familiar statement that,

“...the mechanisms by which psychological stress promotes oxidative damage are poorly understood.”

This statement is, however, rather surprising; Dr Russell Blaylock, a former neurosurgeon, explains in his 2006 book *Health and Nutrition Secrets* that stress increases the rate of metabolism and that increased metabolism increases the generation of free radicals. In the absence of adequate levels of antioxidants to counter them, free radicals will induce oxidative stress that can lead to free radical damage at the cellular level. Prolonged distress, therefore, will continue the process of free radical generation and cellular damage that will result in impaired functioning of tissues and organs, including those of the nervous system and brain.

This process is particularly significant with respect to the two most common neurodegenerative diseases; namely Alzheimer's disease (AD) and Parkinson's Disease (PD), both of which have been associated with high levels of oxidative stress; as reported in a 2017 article entitled *Oxidative Stress in Neurodegenerative Diseases: From Molecular Mechanisms to Clinical Applications*, which states that,

“The pathological mechanisms underlying the degeneration of dopaminergic neurons have been correlated to overaccumulation of ROS or other free radicals.”

ROS are reactive oxygen species.

The WHO anticipates that dementia will continue to increase in incidence and prevalence into the foreseeable future; the fact sheet claims that there are approximately 50 million people around the world with dementia and that this number is predicted to reach 152 million by 2050. The reason that the incidence of dementia is anticipated to rise so dramatically in the next few decades is due to expectations that people will achieve ever-increasing lifespans, even though the WHO acknowledges that dementia is not an inevitable consequence of ageing. The credit for increased life expectancy is attributed to 'modern medicine', which is claimed to have reduced mortality, especially infant mortality, by successfully conquering deadly 'infectious diseases' through vaccination programmes; the erroneous nature of this claim has been discussed.

The real reasons that people, both young and old, experience cognitive impairments and neurological problems that may be diagnosed as 'mental disorders', are many and varied; but, like all other 'diseases', they are caused by exposures to various combinations of stressors, both physical and emotional.

It has been demonstrated in this discussion that stressors exert their harmful effects through the same mechanism as all other 'harmful substances and influences'; in other words, through the increased generation of free radicals that induce oxidative stress and lead to damage at the cellular level. It is clear therefore, that all stressors increase the utilisation of the body's supply of antioxidants. This inevitably places even greater emphasis on the importance of good nutrition and the regular intake of antioxidant-rich foods to 'scavenge' free radicals before they cause harm, and to provide support for the body's endogenous antioxidant production system. The nervous system, and especially the brain, can also be protected by avoiding or at least minimising exposures to substances and influences known to have harmful neurological effects.

Efforts to minimise exposures to stressors that can adversely impact the brain, and to increase the intake of protective antioxidants will not only help to slow down and prevent deterioration of cognitive functions, but they can also help to improve them. The reason for this is because another of the long-held beliefs of the medical establishment has been proven to be erroneous; this is the idea that

new brain cells, also known as neurons, were not generated once they had been formed at the age of about 3 years old. In the 1970s, researchers discovered the presence of new neurons in certain parts of the adult brains of some animals. Continued research revealed that the generation of new neurons, also known as neurogenesis, occurs in many parts of the adult brain in many different animals, including humans. A 2008 article entitled *Estrogen and Adult Neurogenesis in the Amygdala and Hypothalamus* states that various factors may influence the rate at which new neurons may be generated. These factors include aspects of the external environment that can affect physiology and,

“...act on neurochemical and/or neurotransmitter systems to affect cellular proliferation and/or survival.”

It should be clear from previous discussions that there are many ‘environmental pollutants’ that can act as physical stressors and contribute to neurological effects.

In the context of Dr Selye’s definition, ‘stress’ is an inevitable aspect of life, but, as he explains,

“...we can learn a great deal about how to keep its damaging side-effects, ‘distress’, to a minimum.”

Prolonged stress that has become ‘distress’ can clearly be debilitating and damaging to health. Although some stressors, such as the death of a loved one, may not be so easy to overcome, it is possible for people to take certain actions that will help to reduce their overall level of stress. The website of Dr Stephen Sinatra MD, for example, contains a page entitled *How to Handle Tension or Stress Headaches* that discusses strategies including diet, relaxation and sleep. On this page, Dr Sinatra, who is one of the co-authors of the previously cited *Earthing* book, refers to the practice of grounding that can ‘de-stress’ and help to re-balance the nervous system. He explains on the page entitled *What is Earthing or Grounding* that,

“Emerging science reveals that direct contact with the ground allows you to receive an energy infusion...”

He refers to this energy infusion as ‘powerful stuff’ that,

“...can restore and stabilize the bioelectrical circuitry that governs your physiology and organs, harmonize your basic biological rhythms, boost self-healing mechanisms...”

The human body clearly possesses mechanisms that are eminently capable of repairing damage to all areas of the body, including the brain, but this requires people to make every effort to avoid or minimise exposures to stressors that are harmful, as Dr Selye states,

“Only by intelligent adjustment of our conduct to the biologic rules is it possible to achieve full enjoyment of eustress without distress.”